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ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: XXX

DATE: Tuesday, August 9th, 1988

BEFORE: M.I. JEFFERY, Q.C., Chairma-

E. MARTEL, Member

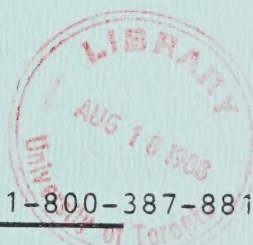
A. KOVEN, Member

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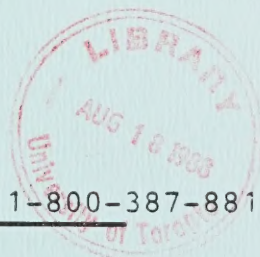
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of an Order-in-Council
(O.C. 2449/87) authorizing the
Environmental Assessment Board to
administer a funding program, in
connection with the environmental
assessment hearing with respect to the
Timber Management Class
Environmental Assessment, and to
distribute funds to qualified
participants.

Hearing held at the Ramada Prince Arthur
Hotel, 17 North Cumberland St., Thunder
Bay, Ontario, on Tuesday, August 9th, 1988,
commencing at 8:30 a.m.

VOLUME XXX

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	MINISTRY OF NATURAL
MS. C. BLASTORAH)	RESOURCES
MS. K. MURPHY)	
MR. B. CAMPBELL)	MINISTRY OF ENVIRONMENT
MS. J. SEABORN)	
MR. R. TUER, Q.C.)	ONTARIO FOREST INDUSTRY
MR. R. COSMAN)	ASSOCIATION and ONTARIO
MS. E. CRONK)	LUMBER MANUFACTURERS'
MR. P.R. CASSIDY)	ASSOCIATION
MR. J. WILLIAMS, Q.C.	ONTARIO FEDERATION OF
	ANGLERS & HUNTERS
MR. D. HUNTER	NISHNAWBE-ASKI NATION
	and WINDIGO TRIBAL COUNCIL
MR. J.F. CASTRILLI)	
MS. M. SWENARCHUK)	FORESTS FOR TOMORROW
MR. R. LINDGREN)	
MR. P. SANFORD)	KIMBERLY-CLARK OF CANADA
MS. L. NICHOLLS)	LIMITED and SPRUCE FALLS
MR. D. WOOD)	POWER & PAPER COMPANY
MR. D. MacDONALD	ONTARIO FEDERATION OF
	LABOUR
MR. R. COTTON	BOISE CASCADE OF CANADA
	LTD.
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MR. R. BARNES)	ASSOCIATION
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MR. B. McKERCHER)	OUTFITTERS ASSOCIATION
MR. L. GREENSPOON)	NORTHWATCH
MS. B. LLOYD)	

APPEARANCES: (Cont'd)

MR. J.W. ERICKSON, Q.C.)	RED LAKE-EAR FALLS JOINT
MR. B. BABCOCK)	MUNICIPAL COMMITTEE
MR. D. SCOTT)	NORTHWESTERN ONTARIO
MR. J.S. TAYLOR)	ASSOCIATED CHAMBERS OF COMMERCE
MR. J.W. HARBELL)	GREAT LAKES FOREST
MR. S.M. MAKUCH)	PRODUCTS
MR. J. EBBS	ONTARIO PROFESSIONAL FORESTERS ASSOCIATION
MR. D. KING	VENTURE TOURISM ASSOCIATION OF ONTARIO
MR. D. COLBORNE	GRAND COUNCIL TREATY #3
MR. R. REILLY	ONTARIO METIS & ABORIGINAL ASSOCIATION
MR. H. GRAHAM	CANADIAN INSTITUTE OF FORESTRY (CENTRAL ONTARIO SECTION)
MR. G.J. KINLIN	DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC	MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES	ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI	BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY
MR. R.L. AXFORD	CANADIAN ASSOCIATION OF SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON

(iii)

APPEARANCES: (Cont'd)

MR. C. BRUNETTA

NORTHWESTERN ONTARIO
TOURISM ASSOCIATION

(iv)

I N D E X O F P R O C E E D I N G S

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<u>JOHN EDWARD OSBORN, Recalled</u>	
<u>KENNETH A. ARMSON, Recalled</u>	
<u>DAVID GORDON, Sworn</u>	
<u>JOHN RANDOLPH CARY, Sworn</u>	4937
Continued Direct Examination by Mr. Freidin	4937

1 ---Upon commencing at 8:35 a.m.

2 THE CHAIRMAN: Good morning. Please be
3 seated.

4 Mr. Freidin?

5 JOHN EDWARD OSBORN,
6 KENNETH A. ARMSON,
7 JOHN RANDOLPH CARY,
 DAVID GORDON, Resumed

8 CONTINUED DIRECT EXAMINATION BY MR. FREIDIN:

9 Q. Mr. Cary, yesterday the Chairman
10 asked you if demand had kept pace with the demand which
11 was anticipated at the time the Implementation Schedule
12 started, and you indicated that records weren't kept of
13 the harvest, but at the beginning of the Implementation
14 Schedule you felt that the demand and the harvest were
15 fairly close.

16 The Chairman then asked you whether there
17 was a growing gap and you said I don't know, a future
18 panel will address this.

19 What did you understand the Chairman to
20 mean and, in particular, what did you mean when you
21 answered that question?

22 And I meaning, what did you understand
23 the Chairman to mean by the term "growing gap"?

24 MR. CARY: A. What I understood the
25 Chairman to mean was the gap between actual demand and

1 our projection of demand.

2 Q. And will that particular matter be
3 dealt with by another panel?

4 A. It will be dealt with by this panel.
5 Mr. Gordon and Dr. Osborn will be making a forecast and
6 it will also be dealt with, as I said yesterday, by
7 Panel 5.

8 Q. Thank you.

9 THE CHAIRMAN: Thank you.

10 MR. FREIDIN: Q. You also recall
11 yesterday I referred you to a number of reports: The
12 Dixon Report, the Armson Report, the Baskerville
13 Report, and asked you some questions as to whether
14 action had been taken by the Ministry as a result of
15 those reports. And you indicated that there had been
16 and there was some discussion about this.

17 Can you advise me, Mr. Cary, does the
18 Ministry of Natural Resources only change when
19 subjected to an assessment which identifies problems?

20 MR. CARY: A. No. We don't react in
21 that way. Peer group evaluations we find to be
22 extremely useful. We continue to do things, some
23 things are ongoing. Much of what we do is coincident
24 with the content of reports. Reports help us focus
25 perhaps on what we are doing and then make advances

1 together with the peer group evaluations and
2 assessments.

3 So certainly on the one hand there is
4 much of what we do which is parallel to or coincident
5 with the reporting, and then there is action that we
6 take with the reports, recommendations.

7 Q. Thank you. Now, you refer to
8 paragraph 22, subparagraph (iv) which you will find on
9 page 27 of the statement?

10 A. Yes.

11 Q. Can you just take a moment to read
12 that particular paragraph before I ask you...

13 A. Yes, I have read it.

14 Q. And can you it tell us why are you
15 outlining those particular developments in the witness
16 statement?

17 A. The reason for that outline is to
18 explain that over the last 14 years we have had some
19 serious problems with protecting the old forest and the
20 new forest. The outbreaks of -- the incidence of wild
21 fire have increased very significantly over the last 14
22 years and you have heard talk about the outbreak of
23 jack pine and spruce budworm in northern Ontario.

24 This has been a costly exercise and I
25 guess the bottom line is the well is only so deep and

1 certainly these protection activities have had an
2 impact on our program.

3 Q. Are you suggesting that it had some
4 impact on the silvicultural aspect of your program?

5 A. In a global sense, yes. There is
6 only so much money.

7 Q. And silvicultural part of your
8 program would deal with -- are they dealt with by the
9 FPPIS Report, the Forest Production Policy
10 Implementation Schedule?

11 A. That's correct.

12 Q. Could you refer to paragraph sub (v)
13 on 27.

14 A. Yes.

15 Q. You indicate there that support and
16 service activities have also increased the cost of the
17 forest resources program. Can you advise me, are the
18 support and service activities that you refer to
19 different from the matters which were referred to in
20 paragraph 22 sub (iii) and those matters were
21 infrastructure, technology, and expertise?

22 A. Yes, they are different.

23 Q. Can you tell me what the differences
24 are?

25 A. In order for the program to make good

1 planning decisions, to be implemented in the most
2 effective way, we need, for example, to undertake
3 forest research. Whether that forest research is in
4 tree improvement or growth in yield, but that
5 information is very useful for the program.

6 Management planning. Again, to make
7 sensible planning decisions we need good information,
8 the collection of planning data is absolutely key so
9 that we can properly implement the silvicultural
10 activities that's at the heart of our program.

11 Tree improvement. Again, if we are going
12 to control the parentage of the seed and improve that
13 parentage, we need to put those operations that make
14 that possible into action.

15 technology development, an ongoing task.
16 To make sure that the technology continues to improve
17 and that the practicing field forester is supplied with
18 the latest techniques so that he can make sure his
19 program is properly implemented.

20 Q. And is that technology development
21 dealt with by the technical -- they are called TDUs, I
22 always forget. What are TDUs?

23 A. Technology development units.

24 Q. And we've heard about those. Do they
25 deal with the type of technology development that you

1 have referred to?

2 A. That's correct.

3 Q. Mr. Cary, can you advise, were the
4 costs of all the things you have referred to, forest
5 research, management planning, collection of planning
6 data, were those things all anticipated at the time of
7 the Forest Production Policy Implementation Schedule
8 was prepared?

9 A. No, they were not. The costs that
10 were projected under the Forest Policy options for
11 Ontario and the costs that were developed to support
12 those options focused on operations, very closely
13 focused on operations, unit costs per acre.

14 So these planning costs, the costs of
15 services and support and infrastructure were simply not
16 anticipated by the original proposal. We found
17 ourselves in the 1980s and in the late 70s in a very
18 different era.

19 Q. What do you mean by that?

20 A. IRM, Integrated Resource Management
21 became formalized. Public participation in our
22 decision-making process came into place. A new way of
23 timber management planning. There were requirements
24 for minimum data collection, Environmental Assessment.
25 We found ourselves in a completely different era and

1 quite necessarily we had to make sure that the data was
2 collected for these purposes and that proper management
3 plans were developed.

4 And just to give you an example, a
5 management plan back in 1970 or '72 probably was 50
6 pages and weighed a quarter of a pound. Now we have,
7 quite necessarily, volumes and volumes and we are into
8 a different level of planning, much more complex and
9 much more costly.

10 Q. And I guess in Panel No. 15 the Board
11 will have an opportunity to see the size of a timber
12 management plan?

13 A. I believe that will be the case.

14 Q. Could I refer you to paragraph 23.

15 A. Yes.

16 Q. It indicates that:

17 "Today much progress has been made and
18 an enhanced forest road access system and
19 improved nursery facilities have been
20 established."

21 You also say in the second paragraph:

22 "In addition, the FMA program generated a
23 much wider base of silvicultural
24 knowledge and expertise in the forest
25 industry."

1 Could you explain what you meant by, or
2 what you mean by that last sentence I read?

3 A. Yes. Prior to the advent of the FMA
4 program in 1980, the foresters and forest technicians
5 in industry were quite appropriately occupied with the
6 extraction of wood from the forest, accessing it and
7 harvesting it.

8 After the FMA program started, their
9 foresters in the companies started to gain other
10 expertise, silvicultural expertise. And now as the
11 program is maturing, there is a body of professional
12 and technical expertise in the industry that is
13 responsible for implementing their silvicultural
14 program. And I believe you encountered that expertise
15 on your recent site visit.

16 Q. Can you advise me, what was it about
17 the FMA program that generated this wider base of
18 silviculture knowledge that you referred to?

19 A. The implementation of the
20 silvicultural activities on the agreement lands.

21 Q. By whom?

22 A. By the industry.

23 Q. And that was -- was that a change?

24 A. Yes, it was.

25 Q. Who was doing the silvicultural work

1 before that?

2 A. The Crown was responsible for
3 implementation of silvicultural work.

4 Q. Could you turn to paragraph 24. In
5 that paragraph you say, after referring to certain
6 progress which you dealt with in paragraph 23, you say:

7 "Nevertheless, technology development
8 particularly and silvicultural treatments
9 has not kept pace with the development in
10 harvesting."

11 And you give two examples. Could you sort
12 of expand on the examples that you have got there so
13 that the statement which I read is fully understood;
14 the statement being:

15 "...technology and development,
16 particularly in silvicultural treatments,
17 has not kept pace with development in
18 harvesting."

19 A. Yes. I would like to illustrate the
20 example upland black spruce sites and then Mr. Armson
21 will talk about the second example which is a mixed
22 hardwoods and conifer stands on deeper soils.

23 The point is I think that we are
24 continually seeking better answers. We don't have all
25 the answers. Our technology keeps progressing and one

1 of the problems that is still with us is the treatment
2 of upland black spruce sites and these sites are a
3 mixture of shallow soil over bedrock, or shallow soil
4 over boulders and interspersed in these sites are wet
5 patches.

6 At this juncture, whether we are
7 conducting site preparation operations or scarification
8 operations on these sites, this complexity of
9 topography, micro-relief, wet and then dry, we do not
10 have machinery that will give us a consistent good seed
11 bed for the germination of black spruce, for example,
12 black spruce seed, and we also have some problems
13 preparing those sites in the most consistent way for
14 the planting of, for example, containers.

15 So those are some of problems that we
16 still face and are making attempts to improve our
17 technology and ensure that we can in fact regenerate or
18 treat as much of that cut over as possible.

19 MR. ARMSON: A. The second example
20 described in paragraph 24 is that dealing with what we
21 call mixed wood stands. These are forest stands of the
22 boreal forest, primarily mixed poplar, some spruce,
23 maybe some jack pine, some balsam fir and white birch.

24 Refresh the Board's memory that in Panel
25 2 I described the development of particularly access as

1 it related to silviculture and timber management in the
2 north and the fact that the introduction of all-weather
3 access roads, particularly from the 1950s, late 1950s
4 on, began to open up areas. Very many of these areas
5 would be of this mixed wood type.

6 The extent of the mixed wood type is a
7 little difficult to pinpoint, there being various
8 estimates because the FRI, as you are aware, doesn't
9 identify mixed woods per se, but if you take the poplar
10 working group with an add mixture of conifers in it or
11 spruce working group with add mixtures of hardwoods,
12 probably we are looking at something of the order of 20
13 to maybe as high as 45 or even 50 per cent in many
14 areas of the forest base that is in stands that would
15 be generally be regarded as mixed wood stands.

16 What has happened is that in many of these
17 stands the utilization by the mills in that locale,
18 whether they be pulp and paper or saw mills, is focused
19 on one, possibly two species. The best example I can
20 give you, many of the mixed wood stands have had large
21 individual spruce, white spruce or jack pine which were
22 of a size that were very economically desirable by saw
23 mills.

24 When these were cut, if there was no
25 market for the remaining poplar or birch, these stands

1 were then left standing. The problem was that how do
2 you regenerate areas within a mixed wood stand in which
3 an individual tree or a few trees have been cut here,
4 there, everywhere. Getting equipment in to it was
5 difficult.

6 As the improvement of poplar and birch has
7 increased in utilization, this had utilized more of the
8 standing wood, but has often created considerable
9 amounts of slash and tops and the problem has been how
10 to use equipment that over the 50s and 60s was designed
11 and developed primarily for black spruce, lowland sites
12 or for weldering jack pine stands, how to use that in
13 these mixed wood stand.

14 Not only were these mixed in terms of
15 species and as utilization proved greater slash
16 occurred which created a problem, but the outland
17 stands generally occurred, because of their nature, on
18 much more variable terrain. Often these were
19 geological materials with large boulders and this
20 created some difficulty because the variation in both
21 the species, the variation in site on these uplands
22 created a mix of conditions which, if you are designing
23 a piece of equipment, it is very difficult to get one
24 piece of equipment that works effectively on a range of
25 conditions.

1 And I think this was an analogy here with
2 the sites that Mr. Cary described which is the shallow,
3 thin soil where you are either dealing with almost
4 exposed rock or very dry areas, thin soil or right
5 through metres away with pockets of deep and possibly
6 even wetter soil. So these were some of the problems.

7 The other -- one of the, in fact not a
8 remedy, but one of the suggestions was: Well, if we
9 don't know how to do deal with them why don't we stop
10 any from of cutting in it. That creates a problem
11 because obviously you are locking up mature and
12 sometimes overmature wood that should be utilized.
13 These are the difficulties that are related to those
14 upland mix wood site.

15 A further one complicated by a biological
16 factor. The species in there, these are stands that
17 for the most part originated after fire. Because of
18 the nature of the terrain, the fire effect is often
19 patchy and creates a mozaic and the species that are
20 there, the poplar and birch, the so-called pioneer
21 species, grow rapidly, mature earlier whereas the
22 spruce, particularly coming in either at the same time
23 or a little later matures later on. So we have a
24 biological age of maturity.

25 So we have a problem in getting our

1 management objectives set for these areas. And
2 basically these factors of availability in the stand,
3 in utilization, in the amount of debris, the amount of
4 variability in the sites themselves and bringing that
5 together in relation to some very clear and sharply
6 focused management objectives has really meant that
7 many of these areas have not received and, in fact we
8 often do not have, currently the appropriate either
9 equipment or in some cases appropriate expertise
10 focused in on these areas.

11 Q. Is this particular concern that you
12 just mentioned being addressed by the Ministry or by
13 any other group?

14 A. Yes. We have some, I believe it was
15 eight years ago in this City, the Ministry sponsored a
16 major meeting of foresters to in fact address the
17 problems of this mixed wood stand and as recently as
18 April of this year, there was a national meeting
19 actually in Edmonton. I bring this up because the
20 problem of boreal mixed woods is a national problem, it
21 isn't something that is peculiar to Ontario.

22 It is probably, and certainly in my
23 opinion, the greatest challenge that foresters
24 practicing silviculture have right now. We have
25 mastered many of the ways of dealing with the jack pine

1 and the black spruce working groups in this province.
2 We have yet to come to grips with the boreal mixed wood
3 in a very effective manner.

4 Q. And you indicated, Mr. Armson, that
5 one of the problems in these mixed wood stands is the
6 amount of slash in the upland mixed woods. Do you get
7 more slash in these upland mixed wood areas than you do
8 in, say, the lowland black spruce areas that you
9 referred to?

10 A. Yes, you get more slash. These are
11 the most productive soils that we have. You therefore
12 get much more wood production in all its forms. You
13 also get a large development of underbrush, woody
14 shrubs, mountain maple, that type of hazle -- beech
15 hazlenut particularly and this again creates problems.

16 So it is -- they are the most productive
17 soils we have and, therefore, in that sense some of the
18 most difficult ones to deal with to bring them into
19 focus our efforts to get production of what we want.

20 Q. Does the fact that the stand --

21 MR. MARTEL: Can I ask a question.

22 MR. FREIDIN: I'm sorry.

23 MR. MARTEL: Can I ask a question. The
24 utilization of the material that's left there after you
25 cut and you select the species you are going to use,

1 there is frequently a good deal of material left there
2 because there appears to be no market for that
3 particular type of fiber.

4 What is the Ministry doing in terms of
5 trying to get industry to either get someone to take
6 that, to haul it out, rather than just leave it
7 unutilized in the wood. I am thinking of poplar for
8 example, if there isn't a mill that's using the poplar,
9 it just stays there cut and on the ground, as I
10 understand it.

11 MR. ARMSON: Mr. Martel, I don't think it
12 is so much what the Ministry is doing as what the
13 marketplace and technology is doing. The best example
14 I can give you is that in the 10 years - I happen to
15 have looked these figures up - from 1976 to 1986 the
16 utilization of poplar increased fourfold from something
17 like 680,000 cubic metres to over 2.7-million. Now,
18 that's a very significant amount.

19 That came about as a result of not only
20 technology, primarily in the pulp industry where there
21 is a utilization. Keep in mind that the poplar, the
22 large poplar in these mixed wood stands, if we go back
23 into the 50s and 60s, primarily went for veneer logs.
24 That meant that they were only very selected stems,
25 clear and so on.

1 So the tops that you would see after
2 those operations would be very large. They would be
3 much larger than would occur if you were taking out
4 poplar for veneer and for pulp. And I think that what
5 we are looking at in terms of utilization of these
6 other species is essentially it is a marketplace-driven
7 situation and that links back to products and
8 technology.

9 The Ministry in itself I don't think can
10 do very much about stimulating that marketplace. What
11 it can do is, again in my opinion, is in its management
12 segregate or determine what stands of the mixed wood
13 stands - because there is considerable variability -
14 are the ones that can be most effectively dealt with
15 the technology at this time in relation to that
16 marketplace and then move in that logical sequence.

17 MR. MARTEL: But since poplar is now
18 being used in the pulp and paper industry where it
19 wasn't formally, when you see tree -- I mean, the
20 public gets really upset when it sees trees maybe with
21 a diameter of so big just left there, tree after tree
22 laying there.

23 I mean, it is one of the things I think
24 the public is really upset about and certainly it is
25 what they complain to me about, that it is just left

1 there and they have a difficulty accepting that those
2 trees are just left there because there is no market of
3 any description.

4 MR. ARMSON: Well, we have wasteful
5 practice regulations which I think deal with the broad
6 areas. But I don't believe, Mr. Martel, in all honesty
7 if you cannot sell a product, then I don't know what
8 you can do with it.

9 We have one fortunate thing I believe
10 that I would suggest where we have slash, large tops
11 which are there because of no marketplace, they are
12 uneconomic - I am not talking about situations where
13 they are left there when they shouldn't be left there
14 and they could be utilized, that's a different matter -
15 but where we have material left, that is organic
16 material. It will decompose, break down and it will
17 add in fact to the organic material there.

18 That may or may not be an important
19 factor, but in that sense we are not losing it in any
20 other way. I understand your concern with waste, but I
21 really believe if it can't be utilized economically and
22 sold, then we are going to see those larger tops left.

23 MR. MARTEL: Have you considered opening
24 up -- for example, when an industry cuts and they leave
25 it there, of having someone salvage it even just for

1 firewood, where many people in northern Ontario -- many
2 many, people try to get firewood and simply can't get
3 it.

4 MR. ARMSON: Well, we have in fact a
5 system for individuals who wish to obtain firewood from
6 cutovers or areas to obtain it and I have been out on a
7 number of these locations particularly in central
8 Ontario and the fact is that Mr. John Smith with a
9 pick-up truck will not go very far back into the bush
10 to pick-up firewood even when he gets it virtually for
11 nothing.

12 There is a limit to -- there is an
13 economic limit, if you would put it in those terms, as
14 to how far a person will go and we still have a large
15 amount of that kind of wood left in the forest.

16 MR. MARTEL: I won't argue and belabour
17 the point but I think I differ with you.

18 MR. FREIDIN: Q. Does the Ministry of
19 Natural Resources utilize stumpage rates to utilize
20 these less desirable or perhaps species, or the species
21 for which there is little market demand?

22 MR. ARMSON: A. Yes. In terms of
23 firewood and what we would call the utilization of
24 slash, yes, they are a very, very low rate.

25 Q. You made a reference to wastage

1 regulations. Now, I believe that will be dealt with in
2 more detail by other panel, but could you sort of just
3 advise at this time what you are referring to?

4 A. I am referring there particularly to
5 stump heights and top diameters and these are related
6 to essentially the current or ongoing technology
7 primarily in relation to both saw mill -- or saw log
8 and pulpwood operations.

9 Q. What do the regulations deal with?
10 You said tops and stumps?

11 A. They deal with the heights of stump;
12 that is, stump heights over a certain level, there are
13 penalties or if there are tops that are left with
14 diameters larger than allowed under the regulations.

15 Q. Are there penalties for that as well?

16 A. Yes.

17 Q. Thank you. I understand, Mr. Cary,
18 that paragraph 25, although it shows up in this first
19 section of the report, is going to be dealt with by Mr.
20 Armson when he deals with regeneration reporting later
21 in the panel?

22 MR. CARY: A. That's correct.

23 Q. Thank you.

24 Mr. Gordon, I would like to ask you
25 questions in relation to the next section of the

1 witness panel starting on page 28, titled: The New
2 Forest Regeneration Effectiveness.

3 Can you advise me, Mr. Gordon, after an
4 area of the forest is harvested or depleted by natural
5 causes, are there means by which the forest manager can
6 assess the state of regeneration on those areas.

7 MR. GORDON: A. Did you say natural
8 causes? You also probably meant harvesting.

9 Q. After a harvest -- I guess, my
10 question was after an area of the forest was harvested
11 or depleted by natural causes.

12 A. Okay. Yes, there are a number of
13 surveys that a manager would consider carrying out
14 depending on the circumstances and what information
15 that manager is looking for.

16 Q. Can you list for me the types of
17 surveys that you are referring to?

18 A. There are two main categories of
19 surveys. The first category are what we call condition
20 surveys where the manager wants to assess the condition
21 of a stand at a given point in time and the other major
22 category is a specialized condition survey called free
23 to grow.

24 Q. And I understand that in terms of
25 condition surveys there are actually two types that are

1 commonly referred to?

2 A. Yes. There are two types; there is
3 survival and stocking and, as well included in
4 condition surveys, are a number of other surveys.

5 Q. All right. Can you just list for me
6 now, just describe the other surveys which you indicate
7 would fall into the category of condition surveys?

8 A. They would include a variety of
9 surveys that look at such things as competition
10 problems, is there a need to tend, to hold back the
11 competition, surveys of pest problems. Is there a need
12 to thin, a variety of surveys.

13 Q. Is there a common purpose for these
14 types of surveys?

15 A. The purpose of the surveys is to
16 provide the manager with some information on the
17 condition on the survey at that point in time and with
18 the manager having that information, the manager can
19 decide whether or not there are any treatments
20 required.

21 Q. You use the phrase condition of the
22 survey, I assume you meant condition of the stand?

23 A. That's correct.

24 Q. And what sorts of things would the
25 forest manager be looking for, just in a general way.

1 You say to determine the condition of the stand at a
2 particular point in time.

3 A. For example -- there are all sorts of
4 examples. For example, the trees that you may have
5 planted on that site, are they still alive and whether
6 you planted a site or seeded a site, is there a
7 competition problem developing and, therefore, you
8 might consider further treatments to fight that
9 competition.

10 Q. You refer to survival and I would
11 like to turn to that type of survey, survival
12 assessments. Can you advise the Board what they are?

13 A. We turn to paragraph 27 on page 28.

14 Q. Yes.

15 A. Survival is a survey that is carried
16 out in relation to planted trees whether they be bare
17 root trees or container trees, it is the ratio of trees
18 that are found living that were planted versus the
19 trees on that site that are planted and it is usually
20 compressed in a percentage.

21 Q. The ratio between the living trees
22 and --

23 A. The living planted trees versus the
24 total number of trees planted on that site.

25 Q. And how do you actually make that

1 determination of the ratio between the planted trees
2 which are living to the total trees which were planted?

3 A. Well, what we do is what we call a
4 survival survey and usually after an area is planted,
5 within a month, within two weeks after it is planted,
6 we put in what are called survival assessment plots and
7 there are a variety of ways of doing that and one of
8 the more common ways of doing that is to do the
9 following, if I can sketch this for you:

10 Q. Take your time, Mr. Gordon.

11 A. Here we have an area that is planted
12 with trees --

13 THE CHAIRMAN: Sorry, you have to speak
14 up, the court reporter can't hear you. Could you take
15 the microphone possibly over.

16 MR. GORDON: Here we have area that is
17 planted with trees and you put in what I call a
18 survival assessment plot and usually what you do in one
19 plot is assess perhaps 25 trees and what you do is the
20 area would be planted with trees all over, and what you
21 would do is find a number of trees, then you would pick
22 a random starting point and you put a pin beside a tree
23 that was planted recently, and you perhaps go along and
24 put five pins in a row and then you would move over and
25 do another plot.

1 And you would continue to do that and you
2 would have a plot which had five areas of fives trees -
3 you have 25 pins besides trees that were planted. And
4 when you wanted to do an assessment, you would come
5 back to these exact pins which are beside trees that
6 were planted and you would look and see if those trees
7 are living or dead. And so if you found beside these
8 25 pins 20 trees that were living, then your survival
9 rate would be 80 per cent.

10 MR. FREIDIN: Q. In terms of survival
11 assessments, they occur on planted areas only; is that
12 correct?

13 MR. GORDON: A. That's correct.

14 Q. And are there -- to do that sort of a
15 survey when you say you go back and see whether the
16 trees are dead beside the -- or alive beside those pins
17 do you actually have to go into the forest, like walk
18 into the stand?

19 A. That's correct.

20 Q. Are there any other forms or methods
21 of doing survival assessments?

22 A. Depending on the competition level on
23 a given site, if there isn't a lot of competition
24 growing up on a site, then all that may be necessary is
25 that you just walk into the middle of the stand and

1 look around and you can see the trees and you can make
2 the decision that most of the trees are living and,
3 therefore, you have been successful.

4 THE CHAIRMAN: Where you have seeded say
5 clear cut area by aerial seeding, could you not use an
6 aerial photoplater on it to find out the ratio of those
7 that survived? Is it not that precise with aerial
8 photography?

9 MR. GORDON: When we do what I call our
10 survival surveys we do those on areas where we plant
11 trees. What you are talking about now is a different
12 type of assessment pertaining to seeding.

13 And what you would do there is, and if
14 you are using aerial photography, perhaps infrared,
15 what you would do is you would do that assessment
16 probably at a much later date than the age of that
17 plantation.

18 What you are talking about compared to
19 survival in planted trees you carry it off, and do
20 that after six months, one year, two years, whereas in
21 the assessment you are talking about you would have to
22 wait until the seed had germinated and the tree had
23 grown to a large enough size that the photograph would
24 pick it up.

25 MR. FREIDIN: Q. And the type of survey

1 that you understand the Chairman is referring to, is
2 that a particular type of survey that you are going to
3 be dealing with in your evidence?

4 MR. GORDON: A. Not directly, no. That
5 will be dealt with through another panel.

6 Q. Could you advise when these survival
7 surveys take place in relation to the time planted.
8 You referred to it briefly, but could you just indicate
9 with some more particularity when these surveys usually
10 take place?

11 A. The standard survival survey takes
12 place two years after planting, however, they may take
13 place six months after planted. If you planted, for
14 example, in the spring you may carry out an assessment
15 that fall, you may carry out an assessment the
16 following year, you may do it five years after
17 planting.

18 Q. Could you advise what reasons might
19 lead to actually doing assessment six months after the
20 planting as opposed to the one or two years?

21 A. Subject to the availability of
22 resources the local manager may believe that on a
23 certain site that is planted with trees that there is a
24 potential competition problem because of previous
25 experience and so therefore because he may or she may

1 planted a site where there is competition problem
2 anticipated the decision made be made to do an earlier
3 survival assessment so that when you go back to do the
4 survival assessment you are also looking at the
5 developing competition.

6 Q. And what do you mean by competition?

7 A. Other plants that compete with the
8 species of interest for light and perhaps can cause
9 physical damage to the trees that you planted.

10 Another example would be perhaps - it
11 doesn't happen very often - but very often we use
12 refrigerated vans to store our trees on the site before
13 we plant them and there may be the odd occasion where
14 you may have had a failure with the refrigeration
15 system and, therefore, you potentially may have a
16 problem with the trees that you have planted.

17 And so, therefore, when you believe that
18 there is a potential problem with those trees because
19 they haven't been stored properly, then the manager may
20 make the decision to go back to those areas earlier
21 than two years and, as well, the manager may make the
22 decision to do a higher level of assessment intensity
23 on those sites, put in more plots.

24 Q. Is there any reason for not doing the
25 survival surveys at six months all the time?

1 A. I think probably managers would like
2 to be looking at as many things as possible. I think
3 we just have to realize we only have so many people and
4 we have to be frugal.

5 We also have to recognize, like for
6 example with some species such as jack pine we are
7 consistently successful so, therefore, it is not
8 necessary to go back and look at six months. Whereas
9 with another species, such as perhaps white spruce on a
10 site where you are anticipate a competition, you may
11 want to go back because the probability of problems is
12 higher.

13 Q. You indicated that sometimes you can
14 go back to a stand for a survival assessment even after
15 two years, and you said you go back five years after.
16 Did I understand your evidence correctly?

17 A. That's correct.

18 Q. And under what circumstances might a
19 forest manager want to go back sort of after an
20 assessment had been done in the second year, what would
21 cause him to want to go back and do another assessment?

22 A. Well, there may not have been a
23 competition problem at that time, but again looking at
24 what was happening on that site at that point in time,
25 he again may have anticipated one or two, or three or

1 years down the road. So, therefore, the manager may go
2 back to do a survival assessment and, as well, look at
3 competition.

4 Q. Are there any standards or defined
5 criteria which indicate what is or is not an acceptable
6 result of such a survey?

7 A. If you mean by that question: Can
8 you go to some book and it sees that in Ontario, when
9 you are planting black Spruce or in Ontario when you
10 are planting jack pine that an acceptable survival
11 level is 90 per cent or 85 per cent you can't find such
12 a number.

13 Obviously when you are planting trees you
14 are spending money, your objective would be 100 per
15 cent survival. We have to recognize that every single
16 tree isn't planted perfectly, every single tree isn't
17 planted on the best micro-site that is available and we
18 are dealing with a biologic entity.

19 However, as a field manager my objective
20 would be - and as it usually is out there with other
21 foresters - is that you are having survival rates in
22 the order of 85 to 90 per cent and you are pleased with
23 what you are seeing.

24 Q. Now, what about the actual planting
25 of the trees. In your curriculum vitae there is

1 reference to you being involved in preparing standard
2 contracts for tree planting. Is that right?

3 A. That's correct.

4 Q. I understand that the monitoring of
5 those tree planting contracts is going to be the
6 subject matter of evidence in Panel 16?

7 A. That's correct.

8 Q. Could you advise at this time,
9 however, in relation to the actual planting of the
10 trees, who plants them and does anyone do anything to
11 ensure that in fact they are planted in a proper
12 manner?

13 A. Okay. First perhaps I should give
14 you a bit of background. When you look at all the
15 trees that are being planted in Ontario on Crown land,
16 about 50 per cent of those trees are being planted on
17 FMA areas and because of the legal agreement that we
18 have with those companies is it is their responsibility
19 to plant those trees and to ensure that they are
20 planted properly.

21 And companies are doing that, they are
22 monitoring the contractors, for example, they hire.
23 The other 50 per cent of the trees that are planted,
24 most of those are planted by contractors that are hired
25 directly by the Ministry of Natural Resources and on

1 those projects, which is the contract that you are
2 talking about and which I was involved in updating, we
3 carried out an assessment of the quality of tree
4 planting almost on the day that the tree planting takes
5 place.

6 And so we look and see if the tree is
7 placed properly in the ground, look at a number of
8 criteria to ensure that the tree is planted properly
9 and if the trees are not planted properly, then the
10 contractor receives a lower payment rate.

11 For the small percentage of trees that we
12 still plant directly through our own projects; i.e.,
13 where we go out and hire the tree planters directly
14 ourselves, the MNR foreman would carry out a quality
15 assessment of the tree planters that we have hired
16 directly.

17 Q. And do the standard contracts set out
18 any performance standards?

19 A. There are very clear performance
20 standards in those contracts and if the contractor is
21 not meeting those standards they receive less money and
22 if their performance is poor the contract can be
23 terminated.

24 Q. When we are talking about a survival
25 assessment, who actually - without these standards in a

1 book or something - who actually makes a decision as to
2 whether an area has been successfully or has been a
3 success in terms of survival or whether it's documented
4 as a success? Who makes that decision?

5 A. That responsibility rests with the
6 unit manager, unit forester or the company forester and
7 they may also -- their senior unit technicians may look
8 at the area and make recommendations to the unit
9 manager as to whether or not the planting has been
10 successful relative to initial survival.

11 Q. Now, if the plantation is determined
12 by the appropriate person to not be successful, the
13 survival assessment is not acceptable, what are the
14 options that that forest manager has?

15 A. He has a number of options. One
16 option would be to consider adding more trees to that
17 site, what we call filling in. Another option is to
18 consider doing nothing. Perhaps because of
19 availability of planting stock or whatever, you may not
20 have the opportunity to go back and add trees.

21 And, as well, although your survival
22 rates may be relatively low in a given site, you may
23 also decide to do nothing because of the natural
24 regeneration that is taking place between the planted
25 trees.

1 Q. Is that a common occurrence in your
2 experience, Mr. Gordon, that you have natural
3 regeneration occurring in areas where you have gone out
4 and planted?

5 A. It happens to varying degrees
6 depending on the site.

7 Q. And when you find that there is
8 natural regeneration in areas where you planted, is the
9 natural regeneration -- is the regeneration the same
10 species or different species than the one you planted?

11 A. It may be the same species, it may be
12 another species.

13 Q. And I understand that Mr. Armson will
14 be referring to the results of certain areas which were
15 planted in the --

16 A. 60s, 70s.

17 Q. Yes, the late 60s, early 70s.

18 A. That's correct.

19 Q. Perhaps we will deal with that matter
20 with more detail there. In the past have records been
21 kept of survival assessments when they occur?

22 A. When survival assessments are carried
23 out - and it is a somewhat formal assessment where you
24 are using pins or whatever -- then there is usually a
25 paper record kept of those assessments and that would

1 be on the individual project files on the management
2 unit.

3 Q. In what form is that type of
4 information found?

5 A. There tends to be some variation in
6 how that information is reported.

7 Q. So I take it then there is no --
8 there wasn't a standard form for recording the results
9 of survival assessments in the past?

10 A. There has been and, however, for a
11 number of reasons, you may or may not use that standard
12 form. There was -- there are a variety of form types
13 available.

14 Q. Variety of...?

15 A. Form types available and, as well,
16 local managers will sometimes design a form that meets
17 their needs for a specific site type.

18 Q. Has any thought been given by the
19 Ministry to having a standard form or method of
20 recording the results of survival assessments?

21 A. In 1986 a committee of foresters
22 reviewed the Silvicultural Information System and the
23 Silvicultural Assessment System that the province had
24 in place since 1981 and they made a number of
25 recommendations and, at this point in time, we are

1 moving towards developing a new provincial information
2 system which is being set up to aid the field manager
3 in making decisions.

4 And it was is going to be computer-based,
5 naturally at this point in time they are doing some
6 debugging of some of the programs and they feel that
7 will be operational some time this fiscal year. And
8 this system allows for the recording of survival,
9 stocking, assessment data.

10 Q. And is the system designed in any --
11 will it permit the recovery of information from various
12 areas of the province in relation to a topic such as
13 survival assessments?

14 A. The system per se is not designed to
15 provide regional and provincial aggregations of such
16 data. The system is designed for the use of the field
17 manager, however, allowances are being made in the
18 system that we can make ad hoc requests for certain
19 types of information. We are trying to build
20 flexibility into the system.

21 MR. MARTEL: Can I ask a question. Even
22 though you have flexibility in the system on an
23 individual basis, would it not be wise to in fact have
24 an aggregate so that the Ministry itself would know
25 whether the money it is expending province-wide on

1 silvicultural practices in fact was successful on an
2 aggregate basis, rather than having to go to every area
3 to ask how successful it had been?

4 MR. GORDON: Determining whether or not
5 you have got success on a given site, I am hoping to
6 show you later, is perhaps not as simple as we believe.
7 For example, when you are looking at stocking results
8 which I will be talking about later, what you have got
9 to do is compare the stocking results to what your
10 objectives were on a specific site and you can end up
11 with a number let's say that says 6 per cent on one
12 site is considered very good and that same number on
13 another site, because of your objectives for that site,
14 the manager would consider is not a satisfactory
15 result.

16 So there you have got an instance of the
17 same number in one case it is a good result, in another
18 case it is a bad result. So if you put those two
19 numbers together provincially, what does it mean.

20 So perhaps, Mr. Martel, if you wouldn't
21 mind, if we could come back to that question after I go
22 a little farther in my evidence.

23 MR. FREIDIN: Q. Yes. In your evidence
24 you refer to silvicultural effectiveness, you also use
25 the term regeneration effectiveness. Do they have

1 different means?

2 MR. GORDON: A. Yes.

3 Q. Could you advise then what the
4 meaning of silvicultural effectiveness is?

5 A. You may have carried out a treatment
6 whereby your objective is to plant black spruce and
7 bring through a black spruce stand. If those trees
8 that you planted on that site survive, then you -- and
9 they develop into larger trees and become free to
10 grow - and I will be discussing that term later - then
11 you have been silviculturally effective in that you
12 carried out a specific treatment type and it was
13 successful.

14 On that same site in another area you may
15 have planted black spruce, but the planted black spruce
16 did not live.

17 Q. And in that situation the objective
18 is the same?

19 A. The objective is the same. So,
20 therefore, obviously you were silviculturally
21 ineffective, the trees died for a number of reasons,
22 whatever reasons.

23 However, on that site where the black
24 spruce has died, you may have had jack pine cones on
25 the site and when you did the site preparation to get

1 the ground ready for planting the black spruce, those
2 cones were scattered they opened up and the jack pine
3 germinated and, therefore, between the black spruce
4 that is remaining you have got jack pine also coming
5 up.

6 So, therefore, when you stand back and
7 look at that stand and take into account the jack pine,
8 you do have regeneration taking place and, therefore,
9 you may have effective regeneration in that
10 circumstance but you have ineffective silviculture in
11 that the planted black spruce trees did not live.

12 Q. In terms of regeneration
13 effectiveness, how useful are survival assessments?

14 A. What a survival assessment does is it
15 gives you a snapshot picture of the condition of that
16 stand at that point in time. If the majority of trees
17 that you planted are alive, then what it indicates to
18 you is the potential for you to have an effective
19 regeneration treatment on that site, but it isn't the
20 final answer.

21 Because, as I will be describing in a few
22 moments, when we have effective regeneration on those
23 sites we declare that stand to be free to grow.

24 Q. And in terms of silvicultural
25 effectiveness do the results of survival -- well, how

1 useful are the results of survival assessments?

2 A. They don't lead you to a final
3 conclusion as to whether you have effective
4 regeneration or not, but obviously either you have --
5 if you have a problem on the site; i.e., low survival
6 rates, then it causes the manager to do some thinking
7 and consider whether lower survival rates are
8 appropriate and were necessary and appropriate to make
9 adjustments in the future treatments to recognize
10 those.

11 Q. The second type of condition survey
12 you refer to, Mr. Gordon, were stocking assessments.
13 Would you advise the Board what a stocking assessment
14 is?

15 A. Perhaps what I first should do is
16 give a definition of stocking. If we were to turn to
17 page 29, paragraph 28. The definition is given is ":

18 "Stocking is an expression of the amount
19 of tree cover on an area in relation to
20 a pre-established norm."

21 I.e., standard. So the area is occupied
22 by the trees that are out there.

23 Q. And you refer to in the next
24 document, Document 11, in the second paragraph you
25 say -- it is at page 161. In the second paragraph you

1 say that:

2 "There are many units with which to
3 measure this relationship;... "

4 You are talking about stocking.

5 "...the choice of unit depends on the
6 type of forest management information
7 that is of interest. Tree cover may be
8 expressed in terms of, for example,
9 numbers of trees per hectare, volume per
10 hectare, or basal area per hectare."

11 Could you explain what is meant by the
12 different units of measurement? What would cause you
13 to use -- and what would cause you to use one measure
14 as opposed to another?

15 A. Stocking survivals, as I will be
16 describing in my evidence, relate to stocking surveys
17 that are carried out in relatively young stands and, if
18 you look at small trees, there is almost no volume in
19 those trees so, therefore, you wouldn't use volume per
20 hectare when you are looking at young plantations.

21 And, as well, because small trees have
22 very little diameter, therefore, the use of basal area
23 per hectare tends to be meaningless when you are
24 looking at small trees, there is no basal area to
25 measure.

1 So, therefore, when you are looking at
2 the plantations and the age that I am talking about,
3 you are looking more at the number of trees that are
4 out there.

5 Q. Could you advise the Board how one
6 would carry out a stocking survey?

7 A. All would happen, the local manager
8 would design a survey, usually it is what we call a
9 systematic survey and perhaps I can go back to the
10 board.

11 Now, the normal way that we carry out a
12 stocking survey is to lay out a grid pattern and so
13 what you would do enter the plantation or area that is
14 seeded, a number of lines, and on those lines you would
15 have plots - we call them quadrates - and normally we
16 use a quadrate that is four square metres in size and
17 the assessor would be moving along the line, define the
18 plot, put in the corners of the plot and look at the
19 plot relative to the species of interest.

20 And if you are doing a stocking survey
21 relative to, for example, jack pine you would look at
22 that plot and is there one living jack pine on that
23 plot or not. If there is at least one living jack pine
24 on that lot, then that plot is stocked to jack pine.

25 And then the assessor would move along

1 another predetermined distance and put in another plot
2 and continue to do that.

3 Q. Now, how would you determine what the
4 stocking was then? You have described the surveyor
5 going along these lines and looking in a number of
6 plots to see whether in fact there is a living tree of
7 the desired species.

8 What does that surveyor do with the
9 information?

10 A. The surveyor goes through a
11 calculation and if we could turn to page 168, which is
12 Document No. 13, and although it deals with the concept
13 of free to grow, we just look at the first portion of
14 it, it talks about stocking.

15 And so the assessor would, in this
16 example, has put in the field 25 plots and on 20 of
17 those plots has found at least one tree. Therefore,
18 the 20 over 25, the stocking level in this instance is
19 80 per cent.

20 Q. I take it that the dots in the little
21 boxes are supposed to indicate a tree of the desirable
22 species?

23 A. That's correct.

24 Q. So the fact that you have two or more
25 of the desirable species in one particular plot...

1 A. It only counts once.

2 Q. Lets assume, Mr. Gordon, that you get
3 a stocking result of 60 per cent on a particular area,
4 are you able to indicate whether that is a good result
5 or a bad result?

6 A. Perhaps what we could do is refer to
7 Document No. 12, page 166. What I have done here is
8 put together examples of two different site types and I
9 will just go through --

10 Q. And just before we get into that,
11 does this particular document speak to Mr. Martel's
12 concern or part of it?

13 A. It speaks to part of it.

14 Q. All right.

15 A. We have got two sites, site No. 1
16 versus site No. 2.

17 In very general terms, site No. 1 is a
18 deep sand and site No. 2 is one of your rougher sites,
19 it is shallow boulder till, lots of stones mixed in
20 with the soil over bedrock. On both sites there was a
21 clear cut, and the unit manager has different
22 management objectives for those two sites.

23 In both cases - and when I talk about
24 management objective in this instance I am only talking
25 about stocking - and in this instance the unit manager

1 wants in both cases a jack pine forest, but recognizing
2 the productivity of the two sites and, as well, the
3 ability to get a number of trees on one site versus
4 another site, he has a higher stocking objective on
5 site No. 1 where he's dealing with deep sands and a
6 lower stocking objective in site No. 2 where is lots of
7 boulders mixed in with the soil and there the stocking
8 objective is only 60 per cent as opposed to 80 per cent
9 on site No. 1.

10 Q. Now, you indicated that there would
11 be a difference in terms of the number of trees that
12 you could get onto one of sites. Were you referring to
13 the number of trees you can plant or were you referring
14 to the number of trees that you could look forward to
15 having on the site in the future?

16 A. It would be the number of trees that
17 you would be potentially looking forward to on that
18 site in the future and that portion of the site is
19 occupied by boulders so, therefore, there isn't as much
20 room for trees to grow.

21 The manager makes the decision relative
22 to the two sites to treat them differently. On one
23 site, the site with the deep sand, the manager decides
24 to site prepare and plant jack pine with the objective
25 of planting 2,500 trees per hectare. On the other site

1 the manager makes the decision to site prepare but
2 aerial seed because planting is difficult and he feels
3 that by aerial seeding jack pine at a given rate that
4 he can achieve 60 per cent stocking on that site, on
5 that rougher site.

6 We will assume that a stocking survey is
7 done on both of these sites, you use the more or less
8 standard or customary plot size of four square metres
9 and, in both cases, the manager has the stocking result
10 of 60 per cent.

11 On site No. 1, when you compare that 60
12 per cent to the manager's objective of 80 per cent, the
13 manager would consider that not to be a satisfactory
14 result, whereas on site No. 2, because he has achieved
15 his objective or her objective of 60 per cent, then the
16 manager has achieved a satisfactory result.

17 Perhaps graphically I could show that the
18 on the next page, 167. To keep things simple, in
19 Ontario at this point it time we are tending to use the
20 same plot size when we do a stocking assessment. So
21 because it is four square metres in size, if you divide
22 four square metres into 10,000 square metres, the area
23 of one hectare, that means you would have 2,500 plots
24 in a hectare.

25 If you have a tree on each of those plots

1 and the trees are evenly spaced, then you would have
2 100 per cent stocking. If you put in the same number
3 of plots, the same size of plots as in site No. 2, but
4 the trees are spread out further then you have a lower
5 stocking rate and even though the number is lower, when
6 you compare that lower number to the objective for that
7 site, i.e., No. 2, the objective has been met.

8 And so that's why, Mr. Martel, these are
9 relative to stocking. You can only go so far in
10 aggregating numbers because sometimes you don't have
11 the specific site management objectives to compare them
12 to and, therefore, it can be misleading.

13 However, if you talk specifically about
14 survival rates for planted trees, then I can see the
15 advantages of aggregating that information regionally,
16 provincially so that over time, over a decade or
17 whatever, you can determine trends and note trends.

18 MR. MARTEL: Is that the direction we are
19 heading though? I think you said we weren't heading in
20 that direction, that's why I raised the matter with
21 you, because I understand the -- you know, 60 per cent
22 is very successful, in fact, that fact that you are
23 setting out to achieve 60 per cent, you achieve a
24 hundred per cent of your goal.

25 MR. GORDON: That's right.

1 MR. MARTEL: The point I am driving at
2 though is, for everyone, including the companies, to
3 look at a set of figures and say: Yes, we are doing
4 well, we have aggregated this province-wide and out
5 there the forest is doing extremely well, we are doing
6 extremely well in what we are spending our money on
7 regenerating.

8 If you don't have the aggregate it is
9 rather difficult, I think, to give a picture of what in
10 fact is occurring.

11 MR. GORDON: There will be a very
12 definite aggregate of a survey called free to grow and,
13 in my opinion, that will clearly tell us how we are
14 doing and that you will be looking at these stands a
15 little later than after you carry out survival and
16 stocking surveys, and that information under the new
17 Timber Management Planning Manual is required to be
18 reported annually per each management unit and that
19 information is aggregated up provincially and actually
20 I believe we had an interrogatory that asked for that
21 information and we provided a summary of three years'
22 of results.

23 What we have to recognize is that free to
24 grow surveys are relatively new, so that it will be
25 over a period of time we will be able to know the trend.

1 There is no question that that will take place and the
2 information relative to stocking surveys and survival
3 surveys will be available at the management unit level.

4 MR. MARTEL: Are we talking about the
5 same thing then, though? Yesterday I was worried about
6 the number of expressions we use and if you are talking
7 about stocking surveys and free to grow. In the final
8 analysis, is it not the same thing, basically?

9 MR. GORDON: Stocking is a component of
10 free to grow and there are a number of other things we
11 consider before we can declare a stand free to grow and
12 I will be getting to those in a moment.

13 MR. MARTEL: Yes, but when you get there
14 and the trees are considered free to grow, isn't that
15 the end result of what you were doing in terms of
16 silviculture, to try and get the forest whipped into
17 shape and so are you not just having a lot of
18 definitions and terms thrown into the jargon that
19 basically says the same thing?

20 MR. GORDON: I think you are asking me:
21 Are we making it more complex than it really is?

22 MR. MARTEL: Yes, I think you are right..

23 MR. GORDON: Perhaps we are. Perhaps for
24 someone who is looking in at us it appears that way.
25 We are obviously not doing that on purpose and I

1 believe we are doing it for valid reasons.

2 For example, a stocking survey does not
3 on its own indicate whether or not you have got
4 effective regeneration. It may, it may not. A
5 survival assessment does not indicate whether or not
6 you have got effective regeneration. It may indicate
7 that you have been effective silviculturally or
8 ineffective silviculturally.

9 What we want to do is wait until the
10 stand develops over a number of years and then take a
11 look at it and use free to grow as a benchmark to say
12 yes, we have been successful.

13 MR. FREIDIN: Q. Perhaps, Mr. Gordon,
14 are survival and stocking assessments ever referred to
15 as interim measures?

16 MR. GORDON: A. We are using the term
17 condition to describe those types of surveys. So, in a
18 sense, we consider them to be interim assessments of
19 how that stand is developing and the benchmark standard
20 that will say that we have done a good job and we have
21 got a forest coming back is going to be and is free to
22 grow.

23 Q. I don't want you to give all the
24 evidence in relation to free to grow, but can you
25 indicate why you want to wait until you have done a

1 free to grow survey before you will want to tell people
2 that you have been successful in having regeneration?

3 Why are you hesitant to say that you have
4 successful regeneration based on survival -- but you
5 aren't willing -- or ready to say that you have got
6 regeneration effectiveness if you have got successful
7 survival and stocking assessments which, as I
8 understand it, occur earlier in the life of a stand
9 than the free to grow survey?

10 A. I think this may show up in Mr.
11 Armson's presentation on SOARS, the results of SOARS,
12 but you can very often have initial high survival rates
13 for planted trees. And on a large portion of the sites
14 out there competition problems do develop, and if you
15 don't take care of those trees, tend those trees, deal
16 with the competition, then even though perhaps you have
17 had 80 or 90 per cent survival rates in year one or
18 two, in year five or seven you haven't tended those
19 sites, you may have a much lower survival rate at that
20 point in time.

21 So, therefore, what we are recommending
22 and planning to do is look at survival surveys as being
23 an estimate of the condition of that stand at that
24 point in time and we will use free to grow as the
25 benchmark as to whether or not we have been successful

1 because we will be making the decision that at that
2 point in time when we believe that a stand is free to
3 grow that it can continue to develop on its own and
4 will require limited treatments from that point on in
5 time.

6 Q. All right. Well then, you say, when
7 it is free to grow you can make a determination or you
8 feel that now the stand can grow on its own.

9 Are you able to make that sort of
10 prediction or will you be comfortable in making that
11 sort of prediction in relation to a stand where you
12 just had survival and/or stocking results, assuming for
13 the purpose of my question, that you had good survival
14 and good stocking results?

15 A. No.

16 Q. And why wouldn't you be comfortable
17 in saying that you had -- that the stand could now sort
18 of grow on its own in those situations?

19 A. Because a number of things could
20 happen because of the dynamics of what's going on on
21 that site. And again the best example is competition.

22 You may have planted a white spruce on a
23 very rich upland site and the survival rate may be
24 initially high year two when you go out and do your
25 survival survey, but three, four, five years later

1 because of the development of grass, other competition
2 some of the white spruce may die and, therefore, even
3 though, if you use survival as your estimate of good
4 regeneration or not you would say yes, but five years
5 later you may have a problem.

6 Q. Could you advise me what are the
7 criteria by which one determines whether a stand is
8 free to grow or not?

9 A. I am looking for a document here.

10 Q. It is Document 13 page 168?

11 A. Yes, Document 13, on page 168.

12 Q. Perhaps it would be useful to just
13 deal with this particular subject matter at this time,
14 Mr. Gordon.

15 A. Mr. Chairman, whether or not a stand
16 is free to grow you look at basically three major
17 factors. No. 1, are there enough trees on the site.
18 You do a stocking assessment, so it must meet a minimum
19 stocking standard.

20 Q. And when you say it must meet a
21 minimum stocking standard, must it meet that standard
22 at the time you did a stocking survey perhaps a year or
23 two earlier, or are you saying it must meet that
24 standard at the time you do your free to grow survey?

25 A. It must meet that standard at the

1 time you do your free to grow survey.

2 Q. So if there has been a change then in
3 the stocking between the time that you did a stocking
4 assessment only some years ago and the time you go to
5 the free to grow -- make your free to grow survey, you
6 will be able to pick up any changes which have
7 occurred?

8 A. That's correct.

9 Q. Okay.

10 A. So the second criteria that you look
11 at is the height of the trees and which tends to be an
12 indication of how well they are established on the site
13 and how well they are growing.

14 And if you look at and we will be looking
15 at them later some regional benchmark standards,
16 usually what we are saying is if a stand has minimum
17 stocking, at least minimum stocking, and the trees are
18 on average at least one metre in height, then they have
19 met two of the criteria for being declared free to
20 grow.

21 The third criteria is that relative to
22 competition you do not anticipate a problem, they are
23 free from competition. Either there is no competition
24 or little competition on the site because of the site
25 type, or there has been competition that you dealt with

1 through tending practices or, in looking at the
2 relative growth rates of the competition that is on the
3 site, and on the crop trees or the species of interest,
4 you anticipate that the jack pine or black spruce will
5 stay ahead of the competition.

6 Q. So when a free to grow survey is done
7 and if in fact a stand that you are looking at meets
8 the three criteria, it has a minimum stocking standard,
9 it has a minimum height requirement and is essentially
10 free of competition which may impede growth, in those
11 circumstances, Mr. Gordon, would you be comfortable in
12 indicating that the stand could now, as you put it,
13 grow on its own?

14 A. Generally that will be the case.
15 There is no question though, obviously usually this
16 will be happening when on average stands are 10 years
17 old and that doesn't mean that after you declare a
18 stand to be free to grow because it has met those
19 criteria at age 10 you don't go back and look at it
20 again.

21 What we have to recognize is we are
22 dealing with rotations in northern Ontario that can
23 vary between 50 and a hundred years. And so obviously
24 the possibility of competition developing in that --
25 over that period or a pest problem developing, you

1 know, must be recognized. So you will on occasion go
2 back and check.

3 Q. In terms of the competition -- well,
4 you mentioned the age -- the timing of these
5 assessments. Is there any general time after -- is
6 there any general age of a stand which would indicate
7 it was time for a stocking assessment?

8 A. That's a judgment made by the local
9 managers to do when they carry out a stocking
10 assessment.

11 Q. And can you - and maybe perhaps you
12 have done this - can you give any ballpark averages as
13 to how old stands are when you go out and do free to
14 grow surveys, minimum ages, let's say?

15 A. It will vary, but in the order of 10
16 years old.

17 Q. When you do a free to grow survey,
18 and I am still referring to page 168, how is the
19 determination made as to whether the area is
20 essentially free of competition?

21 A. Relative to the first two criteria
22 where you actually go out and do basically a
23 mathematical measurement, a judgment as to whether or
24 not the stand is free from competition is made by
25 senior staff on the unit and that can be made by -

1 depending on site characteristics and species
2 involved - that can be made by walking through the
3 stand, it could be made by flying over in a helicopter,
4 or it can be made by setting up a survey methodology
5 that allows less senior staff to collect the necessary
6 information which then can be put in front of the
7 senior manager who will make that decision.

8 Q. Is it always necessary to actually go
9 into the stand to determine whether it is essentially
10 free from competition?

11 A. No, it is not only not necessary to
12 do that relative to freedom from competition but you
13 can judge a stand to be free to grow relative to the
14 two other criteria by low-level flying with a
15 helicopter.

16 Q. All right. Perhaps now we can go
17 back to stocking.

18 THE CHAIRMAN: Mr. Freidin, I think we
19 are going to take a break at this time.

20 MR. FREIDIN: Okay.

21 THE CHAIRMAN: 20 minutes. Thank you.

22 ---Recess taken at 10:00 a.m.

23 ---Upon resuming at 10:25 a.m.

24 THE CHAIRMAN: Thank you. Be seated,
25 please.

1 MS. KOVEN: Excuse me, Mr. Freidin. At
2 page 167 is there a mislabeling of those diagrams,
3 Exhibit 135?

4 MR. FREIDIN: A mislabeling of the
5 diagrams?

6 MRS. KOVEN: Yes.

7 MR. FREIDIN: Unless it was one of those
8 pages which was the subject matter of a change, I am
9 not aware of one.

10 MRS. KOVEN: It is just confusing to me
11 that there are two diagrams, one is site 1 and it talks
12 about 100 per cent stocking, one is site 2 and it
13 labels it 60 per cent stocking.

14 MR. FREIDIN: Oh, I see.

15 MRS. KOVEN: And the conclusion is 60 per
16 cent ratio.

17 MR. GORDON: If I may try and help. I
18 can see why it is not clear.

19 The objective there was, in the diagram,
20 to show what 100 per cent stocking would mean on site
21 1. And the purpose of the diagram relative to site 2
22 was to show what 60 per cent stocking is.

23 And then I put in those notes at the
24 bottom to show that if you did have 60 per cent
25 stocking on site 1, then relative to the stocking

1 objective on the previous page for that site, you would
2 consider that that is not satisfactory.

3 MS. KOVEN: Thank you.

4 MR. FREIDIN: Q. In relation to the
5 stocking standards which have already been referred to,
6 the situation where a management objective for stocking
7 would be set by the forest manager, can you identify
8 the factors which most commonly have an effect for the
9 management objective for stocking?

10 MR. GORDON: A. There are a number of
11 factors and they tend to be always inter-related. The
12 first one would be the site conditions: What is the
13 ability of that site to support a new forest of a given
14 stocking.

15 As well: What monies are you considering
16 expending on that site, are you considering leaving
17 that site relative to natural regeneration, or are you
18 considering a fairly high level of investment on that
19 site, spending money to plant trees, or perhaps
20 something inbetween, aerial seeding. And, obviously,
21 when you tend to plant, when you tend to spend more
22 money on a given site, your objective for stocking
23 would tend to be higher.

24 As well, timber management continues to
25 evolve in Ontario, I think we will be paying more and

1 more attention to what is the manager's objective
2 relative to product from a given site and perhaps we
3 will see adjustments in stocking objectives that
4 reflect the desire of the manager to produce saw logs
5 versus pulpwood.

6 So, therefore, in the future we could
7 intest -- take that stocking results may vary when you
8 are planning on growing trees for pulpwood which is
9 volume, versus trees for saw logs, bigger trees and,
10 therefore, your objective may reflect that and you may
11 have a little more space between the trees and,
12 therefore, be willing to accept a lower stocking level
13 when you are trying to grow saw logs, because with the
14 greater space, the trees can tend to put on more
15 diameter growth and, therefore, produce a larger saw
16 log over time.

17 Q. What are the options of the forest
18 manager if the stocking is below the management
19 objective?

20 A. The manager has a number of
21 alternatives. As I stated earlier, he can or she can
22 consider doing nothing, except the stocking level that
23 is there and that is below the desired but perhaps
24 still above a minimum. The manager can consider adding
25 additional trees to that site and, as well, the manager

1 will obviously consider amending future treatment
2 practices to reflect anything that was learned from
3 that experience.

4 Q. All right. Are there situations that
5 arise where you go into a stand for stocking assessment
6 purposes and you determine that, in fact, the
7 management objective for stocking is met but
8 nonetheless you have actually got too many trees?

9 A. That does happen on occasion in
10 Ontario. For example, you may have aerially seeded a
11 site and you may have gotten better catch than you were
12 generally anticipating and so, therefore, in parts of
13 that stand you may have more trees growing than you
14 anticipated; the density is higher, there is more trees
15 per unit area and, therefore, the trees tend to crowd
16 each other.

17 Usually, however, when we are dealing
18 with a species in Ontario they tend to self-thin and
19 that over time some of those trees, because of
20 competition with trees of the same species some of
21 those trees die and, therefore, there is more room for
22 the remaining trees.

23 Q. Are there any occasions where, as a
24 result of having too many trees in the stand at that
25 early stage, a tending activity is required to thin the

1 stands?

2 A. One could consider that.

3 Q. Mr. Gordon, assume that you are
4 planting two sites. Is there any relationship between
5 the management objective for stocking and the amount of
6 planting which occurs on the site?

7 A. Obviously if you are planting two
8 sites and, for a number of reasons, you are intending
9 to end up with a lower stocking level on one site
10 versus the other site, then you would tend to plant
11 fewer trees on that site.

12 Q. As opposed to planting the same
13 number of trees?

14 A. That's correct. If you, as a
15 manager, make the decision that on a certain site you
16 want a certain stocking level and the way you are going
17 to achieve that stocking level is through planting, and
18 when you compare that to another area where you are
19 planting a much higher number of trees because you want
20 a higher stocking level, obviously you are going to
21 plant less trees.

22 Q. Is the stocking objective recorded in
23 timber management plans?

24 A. Yes, it is. If you could just give
25 me a moment.

1 THE CHAIRMAN: Sorry, what was your last
2 question, Mr. Freidin?

3 MR. FREIDIN: Is the stocking objective
4 recorded in a timber management plan.

5 MR. GORDON: Yes, it is. If you turn to
6 page 65 in the TMP Manual you will find Table 411.

7 MR. FREIDIN: Exhibit 7, page 65.

8 Q. Mr. Gordon, could you indicate where
9 in fact this information is recorded?

10 MR. GORDON: A. In general terms this is
11 the table where the manager outlines his objectives for
12 a given working group or forest unit. And if you go
13 over to the right-hand portion of the table you will
14 see the three columns under stand stocking standards,
15 and below that you will see minimum, desired and
16 acceptable species.

17 And for each working group or forest unit
18 that the manager is dealing with, the manager would
19 list what the minimum stocking standards are for that
20 working group, as well, what the objective or the
21 desired level is and, as well, what species will count
22 towards that stocking.

23 Q. And when would there be more than one
24 species that would be acceptable to be counted for
25 stocking purposes?

1 A. I would anticipate that it would
2 probably be in most cases and that although your
3 objective may be, for a given working group or forest
4 unit, to bring back black spruce, you are very often
5 willing to accept white spruce or jack pine on that
6 site so, therefore, you would list those species as
7 being acceptable and they would count towards the
8 stocking.

9 Q. And are you able to advise whether
10 the manual requires information in relation to stocking
11 for both areas which are artificially regenerated and
12 naturally regenerated?

13 A. That is correct.

14 Q. It does require that information be
15 contained there, in both cases?

16 A. That is correct.

17 Q. Thank you. Can I direct your
18 attention to Document No. 11 which is at page 161 of
19 the witness statement.

20 The third paragraph you indicate that:
21 "The measure of stocking would then
22 involve the ratio of the actual stand
23 measure of numbers of trees, volume or
24 basal area to a norm or standard. The
25 standard is represented by the management

1 expectations for the species and site of
2 interest, in the best case scenario would
3 be based upon site-specific information."

4 What do you mean by the phrase -- or when
5 you say that the best information would be
6 site-specific information?

7 A. As I indicated earlier, when we do
8 stocking surveys for young plantations in the boreal
9 forest we use a plot size of four square metres and
10 that tends to mean that to, and it does mean that to
11 achieve 100 per cent stocking you must have 2,500 trees
12 evenly spaced and that is sort of your standard that
13 you compare all your work to.

14 At this point in time we don't have data
15 that allows us to set stocking objectives that vary
16 site by site, we have not collected the information.

17 Q. What sort of information would you
18 need in order to actually have site -- be able to set
19 site-specific standards?

20 A. Basically what you are looking at is
21 growth and yield studies. You would want to see for a
22 given range of sites how stands of certain stocking
23 develop over time. And so perhaps, you know, for a
24 given site type of a stocking level of 70 per cent may
25 give you the objective you are looking for at rotation

1 and on another site type maybe 100 per cent and
2 another site type 40 per cent.

3 Q. When you say site type, can you just
4 indicate to me what you mean by that?

5 A. Site type, where the conditions vary
6 out there in the forest, whether you are looking at an
7 area that very wet, swamp, an area with deep sand, an
8 area with boulders.

9 Q. Thank you. In the evidence in Panel
10 No. 3 Dr. Osborn described stocking when he was
11 explaining the forest resources inventory. Are you
12 able to advise whether the stocking which he was
13 referring to is any different from what you have
14 described?

15 A. I wasn't here when Mr. Osborn gave
16 his testimony, but I can assume that, No. 1, the
17 stocking information that I am presenting relates to
18 young stands and Mr. -- Dr. Osborn was talking about
19 stocking generally in terms of older stands and he was
20 looking at a relationship between a Crown closure and
21 basal area as opposed to what I am talking about, stock
22 quadrates in young stands.

23 Q. Those are two different ways of
24 measuring stocking?

25 A. That is correct.

1 Q. Are they measuring the same thing?

2 A. They are measuring how well the site
3 is occupied and they are measuring it using two
4 different methods because the stand conditions are
5 different. The stands that I am talking about in this
6 evidence are young stands, whereas the stands Mr. --
7 Dr. Osborn was talking of tend to be older stands.

8 Q. Thank you. I want to move onto free
9 to grow standards and we have covered some of that
10 already. If you could -- in your evidence you
11 indicated there were three criteria for free to grow
12 and the third one was that the area be essentially free
13 from competition.

14 And you indicated that competition could
15 include species other than the ones that you want on
16 the site competing for light or causing physical
17 damage.

18 Could you indicate why the competition
19 for light would cause a problem or does it cause a
20 problem everywhere in all types of forests?

21 A. No, it doesn't. When I made that
22 comment that was in reference generally to the boreal
23 forest and what we call the intolerant species that we
24 have in northern Ontario.

25 Q. And when you use the phrase

1 intolerant species, what does that mean?

2 A. They are intolerant to shade, they
3 prefer lots of light to grow in.

4 Q. And if they don't get lots of light
5 to grow in, what is your understanding as to the
6 results?

7 A. Two things happen or a combination of
8 two things; they grow slower, or they die.

9 Q. And I understand that other panels
10 will indicate the actual type of operations that do
11 take place as a result of a concern where competition
12 exists?

13 A. That is correct.

14 THE CHAIRMAN: Mr. Gordon, excuse me a
15 moment. Mr. Gordon, on the site visit we saw a number
16 of stands of jack pine which have mostly the lower
17 branches off with the top part of the tree still in
18 tact.

19 And I understood the reason for that was,
20 is that as the tree grows the lower branches do not
21 receive enough light and eventually just drop off, so
22 you end up with a fairly tall stem and then the
23 foliage, whatever it is, towards at the top. That is
24 normal, though, for that kind of species, so that would
25 not be considered intolerant; is that correct?

1 Or would it be considered an intolerant
2 species because all you are left with with a mature
3 tree is the foliage at the top and not much on the way
4 up the stem?

5 MR. GORDON: I think perhaps we are
6 talking about two different things here. When I use
7 the term intolerant - I think we were talking about
8 jack pine - it would not be relative to the lower
9 branches dropping off which does, happen as you pointed
10 out, but would be relative to, if there were perhaps
11 poplar trees on that site - and perhaps where you were
12 there wasn't - and I have seen it where there is.

13 The poplar trees very often grow quicker
14 than the jack pine. And so, therefore, the leaves of
15 the poplar tree are over the top of the jack pine and ,
16 therefore, because of not only the shade of the jack
17 pine branches that are over the lower jack pine
18 branches, but also because of the shade of the poplar
19 leaves which are over the whole jack pine tree, more of
20 the branches will drop off, in simple terms, off the
21 jack pine.

22 And so, therefore, because it doesn't
23 have as many needles left, it will tend to grow a .
24 little slower and over time it may disappear from that
25 site because the poplar is growing quicker and

1 competing.

2 THE CHAIRMAN: Okay, thank you.

3 MR. MARTEL: Some of the conifers grow
4 better in shade; don't they, the white pines, red pine?

5 MR. GORDON: For example, if you compare
6 white spruce and black spruce both would be considered
7 shade intolerant, but white spruce can stand some shade
8 as opposed to black spruce, like there is varying
9 levels. There is a gradient. Red pine, as far as I
10 have seen, seems to grow best out in the open. White
11 pine, for a number of reasons, does seem to prefer some
12 type of competition shading around it.

13 MR. FREIDIN: Q. Are you able to add
14 anything to that explanation, Mr. Armson?

15 MR. ARMSON: A. In terms of growth,
16 maybe I should say to the Board I will be dealing with
17 so aspects of this in Panel 9, but in terms of growth
18 for tree species, all tree species, essentially they
19 grow well the more light they get.

20 What Mr. Gordon has said is that some can
21 grow relatively well under lower light intensities.
22 With species like white pine, one of the prime
23 difficulties in growing in the open is it is much more
24 susceptible to weevil attack. it doesn't grow better in
25 the shade, but when it is in the open in many areas it

1 is weeviled and, therefore, it becomes very much bushy.

2 White spruce will grow well in the open,
3 but in situations where there are early spring frosts
4 or early summer frosts, it gets frosted badly so it
5 becomes -- so it isn't so much the question of light as
6 other factors that come into play.

7 But there are species, the hemlocks for
8 example, and the sugar maples they can grow relatively
9 well in very low light intensities. As Mr. Gordon
10 said, red pine doesn't, it requires high light
11 intensity.

12 Q. And the second thing you mentioned
13 when you were talking about competition was that the
14 competition might cause physical damage to the trees
15 that you wanted. Is that a brief explanation.

16 MR. GORDON: A. That's correct. I have
17 been in stands of black spruce, white spruce where you
18 have got poplar and your objective was to grow those
19 two conifer species and because the poplar tree is as
20 tall or taller than the spruce, when there is a wind
21 the poplar top tends to move back and forward in the
22 wind and can damage the top of the white spruce or
23 black spruce tree. And if it damages the terminal bud,
24 the bud at the very top of the tree, that has an effect
25 on height growth.

1 Q. Thank you. The free to grow
2 standards -- the criteria which you described earlier
3 in your evidence, are they used in both the boreal and
4 the Great Lakes/St. Lawrence forest regions?

5 A. Generally, no. In the boreal forest
6 region we are tending to deal with a silvicultural
7 system which is called clear cut and in southern
8 Ontario we are dealing with intolerant hardwoods and we
9 tend to deal with a system where we have selection cuts
10 where we move one tree at a time as opposed to a clear
11 cut.

12 And so, therefore, in southern Ontario
13 where you are dealing with intolerant hardwoods such as
14 maples, you always have a forest, it is always there.
15 You are just going in at different times and removing
16 certain trees.

17 So because you always have a forest and
18 you have got big trees in that forest and they are
19 doing well that forest is basically free to grow all
20 the time, whereas in northern Ontario, because of the
21 species we are dealing with and because -- we clear cut
22 them because of the species we are dealing with, at
23 given points in time, obviously, you don't have a
24 forest there it is just starting out again and,
25 therefore, you must have something like free to grow to

1 standards which would be applicable in those stands.

2 Q. What is the purpose of doing a free
3 to grow survey?

4 A. There are a number of purposes. The
5 obvious purpose is to see how you are doing: Is there
6 a forest coming back and that is obviously a very
7 important reason to do them. And then there is the
8 other reason that if an area is declared free to grow
9 then I believe, as Dr. Osborn pointed out earlier, the
10 area can be entered back in the MAD land base.

11 Q. And the effect of being in the MAD
12 land base?

13 A. By having more area in the MAD land
14 base it increases the area that you can deplete
15 harvest, et cetera.

16 Q. How is a free to grow survey actually
17 done, by whom is it done and what method is used to
18 determine whether in fact the standards meet the
19 criteria that you have referred to?

20 A. Well, I have explained in general
21 terms how a stocking survey is done and that you go out
22 and put quadrates in. That is one method, what I would
23 call an intensive survey method.

24 The other of course is to walk through it
25 or fly over it with a helicopter at low levels. Those

1 are what I call pocular surveys, low intensity surveys.
2 As far as heights, very simple: You take out a tape or
3 ruler and measure the height of the tree and
4 competition tends to be a judgment call.

5 Q. And who does the free to grow
6 surveys?

7 A. I specifically have not been involved
8 directly in a free to grow survey because it basically
9 is a relatively new concept. It will vary from unit to
10 unit. In some locations it will be senior unit
11 technicians, unit forester; in other locations it will
12 be contract personnel, there will be a contract let out
13 and it will have in detail how the data is to be
14 collected so that the unit manager can make the
15 decision as to whether or not that stand is free to
16 grow.

17 Q. And are you aware or are you able to
18 indicate who does the free to grow surveys on company
19 management units and forest management agreement units?

20 Is it in all of them as you have just
21 described?

22 A. Whether it is a -- for the purposes
23 of declaring an area officially free to grow and,
24 therefore, putting it back in the MAD land base, the
25 production forest land base for MAD calculations,

1 whether it is Crown management unit, a company
2 management unit or an FMA, it is the Crown who is
3 responsible for ensuring that survey is carried out.

4 That does not mean that companies will
5 not be carrying out free to grow surveys, obviously
6 they can do that, but relative to official declaration
7 of free to grow, that is our responsibility.

8 Q. You indicated that free to grow --

9 MR. MARTEL: Can I ask a question. Do
10 you actually send somebody out to the sites or do you
11 take the word, let's say, of a professional forester
12 from the industry who has gone out to do the work?

13 MR. GORDON: The way we do it in Ontario
14 is a lot -- many cases I would take the word of a
15 professional forester who is working for the company.
16 The way we do it is we go out and do a survey of some
17 sort. That is our responsibility to do so. And
18 perhaps I could turn to Mr. Armson, if he wanted to to
19 add any comment to that.

20 MR. ARMSON: Yes. In the negotiations
21 for the forest management agreements, one of the points
22 that was kept absolutely clear was that the
23 responsibility for determining whether an area that had
24 been treated, regenerated under the agreement, that
25 responsibility lay completely with those representing

1 the owners and that meant the Ministry staff were the
2 ones that had that responsibility.

3 The company might -- in fact, would
4 identify areas, candidate areas and so on, but the
5 ultimate responsibility for saying whether they were or
6 they were not free to grow was the Ministry's.

7 MR. MARTEL: I am not sure you answered
8 my question, Mr. Armson. What you have said to me, I
9 think, is that the responsibility for declaring it free
10 to grow rests with the Ministry.

11 What I asked is: Who actually goes out
12 to survey it, to determine whether it is free to grow?
13 Do you accept the word of someone else or is it a
14 Ministry forester that actually does these surveys?

15 MR. ARMSON: No. In the FMAs, in setting
16 them up, it was the Ministry staff who would physically
17 identify -- not identify, it would be identified by the
18 company, but they would physically go out and assess
19 them and say this will go free to grow, yes.

20 MR. FREIDIN: Q. A Crown employee?

21 MR. ARMSON: A. Crown, yes.

22 MR. MARTEL: All right, thank you.

23 MR. FREIDIN: Q. Q. You indicated a
24 moment ago, Mr. Gordon, that the FTG surveys, the free
25 to grow surveys, are relatively new. And can you

1 advise how long free to grow surveys have been done in
2 Ontario?

3 MR. GORDON: A. The free to grow concept
4 in Ontario came into being with the advent of the FMA
5 program which is approximately 1980, and I will be
6 talking about it probably in a few moments, a type of
7 free to grow survey called an NSR survey is done prior
8 to the signing of any FMA agreement.

9 So there have been some free to grow
10 surveys done since 1980. However, on company and Crown
11 management units, the free to grow concept has only
12 been introduced in the last few years and it is very
13 clear through the Timber Management Planning Manual
14 that now is followed in all units that free to grow
15 surveys will be carried out on all units.

16 Q. And the application to all management
17 units of a free to grow concept then arose with the new
18 Timber Management Planning Manual and can you pinpoint
19 the year?

20 A. It was 1986.

21 Q. And you indicated that the concept
22 was first introduced when the FMA program began. Are
23 you able to advise why it was introduced at that time?

24 A. Probably, again I think I will turn
25 to Mr. Armson.

1 MR. ARMSON: A. The basic reason for
2 introducing free to grow was that in the cycle of
3 events, the 20-year cycle for inventory, re-inventory
4 of an area, the period of time, the 20 years, was a
5 very long time in terms of having areas which had been
6 harvested, had subsequent regeneration treatments, or
7 had been left for natural regeneration and had been
8 then left, if you like, almost in limbo.

9 And we looked at a set of measures which
10 we termed free to grow which in fact could be used by
11 the forester, by Ministry staff to look at those areas
12 and, as an interim step, identify them as qualifying
13 for coming back into the inventory, being given an
14 inventory designation and, therefore, being available
15 for the calculation in the MAD.

16 That was the purpose of this, to fit in
17 something that did not depend on a 20-year cycle.

18 Q. How long has stocking standards been
19 around? I mean, a stocking is one of the criteria for
20 free to grow. Has that particular survey been
21 practised in Ontario or used in Ontario before 1980?

22 MR. GORDON: A. That's correct. There
23 have been stocking standards in place in Ontario since
24 1971. There was a set developed in 1971, again in 1978
25 and again in 1981.

1 And as well, we have developed recently
2 some regional free to grow benchmark standards which
3 include as part of them, obviously, a stocking
4 standard.

5 Q. And the standards that has been
6 recently developed, are those the ones which are
7 applicable to all management units as of 1986; are
8 those the ones you are referring to?

9 A. They wouldn't be as of 1976, they
10 were recently developed in the past year, but they are
11 applicable to all management units within that region
12 unless specific rationale is identified in a specific
13 management plan that supports reasons for having an
14 adjustment.

15 Q. Are those standards included in the
16 witness statement?

17 A. Yes, they are.

18 Q. We find them at Document 17 which
19 starts at page 177 or 176. Are those the standards you
20 refer to, Mr. Gordon?

21 A. That's correct.

22 Q. And these are standards which were
23 prepared for each region?

24 A. That's correct. There are eight
25 regions in the province and committees were set up and

1 standards were prepared for all of the regions. It
2 just happens there are only seven sets of standards
3 because the southwestern and central regions
4 amalgamated their standards because of the very small
5 forest area involved.

6 Q. And were all species the subject
7 matter of an individual standard or just some of the
8 species?

9 A. All species of interest relative to
10 the managers for that region have standards.

11 Q. All right. And could you advise how
12 these free to grow benchmark standards were prepared?

13 A. Basically within each region a
14 committee was set up which included a government and
15 industrial forester and, based on their experience, as
16 well as reviewing any available standards, historical
17 standards, they developed these benchmark standards.

18 Q. And is there any intent to review
19 these standards over time?

20 A. There is an intent. There isn't a
21 specific time frame relative to when we will update
22 them. That is at the discretion of the regional
23 forester within each region. It is the intent,
24 however, to update them as our silvicultural knowledge
25 increases, as we gain more information about different

1 site types out there.

2 Q. Could you then -- do you have page
3 177 in front of you?

4 A. Yes, I do.

5 Q. The first one is the free to grow
6 benchmark standards for northwestern region dated
7 February of 1987. And we are not going to do this for
8 every document, hopefully we will just do it for this
9 one document.

10 Would you take the Board through that
11 particular page and advise the Board how the
12 information is to be read or interpreted?

13 A. Okay. Well, I will begin on the
14 left-hand side and the first thing you see there is the
15 forest unit of interest and underneath in the first
16 line you see spruce. So in this forest unit,
17 obviously, they are trying to grow spruce.

18 They have identified for that forest unit
19 a variety of renewal treatments and they have
20 identified tree planting versus seeding, modified
21 harvest cutting, versus natural.

22 Q. So the MHC then refers to modified
23 harvest cutting?

24 A. That's correct, the same modified
25 harvest cutting Mr. Cary talked about yesterday.

1 Q. Okay.

2 A. You can see that the growing minimum
3 stocking is in the next column and, therefore, for a
4 stand to have the potential to be declared free to grow
5 it must have at least this minimum stocking. And if
6 you go through - and we don't need to do it right now -
7 but if you go through all of the stands you will tend
8 to see that the minimum is 40 per cent.

9 In the next column, you see the objective
10 stocking and again if you look at the spruce forest
11 unit, you can see it varies from 60 per cent to 40 per
12 cent and what that reflects is in the spruce forest
13 unit where the renewal treatment is planting, your
14 objective stocking is higher because you are spending
15 more money, 60 per cent versus 40 per cent for natural,
16 60 or greater I should say.

17 In the northwest region relative to an
18 area being declared free to grow in the spruce forest
19 unit, the only species they are willing to consider
20 acceptable for that forest unit were spruce.

21 The next criteria that you must look at
22 when you are deciding whether or not to declare an area
23 free to grow is the minimum total height. And as you
24 will generally see if you flip through all the
25 standards is we are talking about one metre usually.

1 And for information purposes in the last
2 column, they have provided an estimate of when the
3 assessment may be carried out, and usually you are
4 looking at a period of 10 years. As you can see it
5 varies. They have said 8 to 12 for the first forest
6 unit. The jack pine forest unit they said 5 to 10 and,
7 of course, we are dealing with a species which tends to
8 grow a little quicker, therefore, it would tend to
9 reach one metre in height a little earlier.

10 Q. In terms of acceptable species, they
11 will accept spruce for the purposes of doing their free
12 to grow assessment, but does that indicate whether or
13 not other species might be in the stand or what species
14 can be in the stand?

15 A. If you look closely at the standards
16 for each region you will recognize that there are
17 differences between the standards and what we have to
18 recognize is that we have committees, several
19 committees across the province, different individuals,
20 different backgrounds, who came up with these standards
21 and they basically, when they were developing the
22 standards, they looked at the forest they were dealing
23 with which does vary across the province and they often
24 made different decisions as to how they would determine
25 whether or not an area was free to grow.

1 And so, for example, in the northwest in
2 the spruce working group, the spruce forest unit, they
3 are only willing to accept spruce as being the
4 acceptable species. That doesn't mean that where your
5 objective was to bring back spruce and there was
6 another species there, that you wouldn't declare it
7 free to grow. What you in all probability would do is
8 perhaps look at the standard for mixed conifer, or you
9 would accept some other species such as jack pine, and
10 the stocking level, when you considered both spruce and
11 jack pine, was above 40 per cent then you could make
12 the management decision to declare that area free to
13 grow relative to the standard for mixed conifer.

14 Q. And I understand that acceptable
15 species is actually defined on page 2 -- I guess page
16 187 of this particular document?

17 A. That's correct.

18 Q. Could you just read that?

19 A. "Acceptable species are those which
20 are allowed to contribute towards the
21 stocking of a stand for assessment
22 purposes. Other compatible species may
23 be present but are not allowed to count
24 towards the stocking."

25 So if you look closer at the northwestern

1 region I think you might be able to pick out some of
2 their;logic. Where their objective was a spruce forest
3 unit, to declare that area free to grow relative to the
4 standard for the spruce forest unit, they are only
5 willing to accept spruce.

6 Similarly, for the jack pine forest unit,
7 they are only willing to accept jack pine. However,
8 they recognize that you could have acceptable
9 generation by having a mix of species and, therefore,
10 they allowed for that in the mixed conifer forest unit.
11 And, of course, that's reasonable because you do have a
12 forest coming back and both of those species you can
13 utilize.

14 Q. Let me give you a hypothetical to see
15 whether I understand this correctly. If you plant
16 spruce, what if a lot of the trees -- a lot trees are
17 on the site, in fact, you have got 60 per cent of the
18 plots occupied by spruce and you have got 40 per cent
19 of the plots on which there is no spruce -- I am sorry,
20 I'm sorry. You have got 60 per cent of the plots
21 occupied -- okay, let's start again. You have got 60
22 per cent of the plots are occupied, 40 per cent of the
23 plots are not spruce?

24 A. And 20 per cent are spruce?

25 Q. I am having trouble following my map

1 here, if you would just hold on a second.

2 A. Could I make a suggestion.

3 Q. You certainly may.

4 A. Okay. You may have a site where you
5 have 60 per cent stocking, the stocking break down is
6 30 per cent of it is black spruce and 30 per cent of it
7 is jack pine. You planted black spruce you really did
8 want to have a black spruce there, you weren't as
9 successful as you hoped because there was jack pine
10 cones on the site, you could have jack pine trees start
11 and that's why you have jack pine stocking on that
12 site.

13 When you look at the free to grow
14 standards for the northwest region, even though your
15 objective was the spruce forest unit and you go to that
16 standard you haven't achieved 40 per cent stocking
17 relative to spruce because you have only got 30 per
18 cent spruce, therefore, you can make the management
19 decision to declare it free to grow relative to the
20 mixed conifer forest unit because that allows for
21 spruce and jack pine and the minimum standard there is
22 40 per cent.

23 Q. And in that particular case, would
24 you be able to say that you were silviculturally
25 effective?

1 A. In that example where your objective
2 was to bring back a stand into black spruce because you
3 had planted black spruce, you were definitely not
4 silviculturally effective. However, you did end up
5 with effective regeneration.

6 Q. Now, you indicated that in this
7 hypothetical you are going after spruce. If you were
8 successful and it went back into the -- you had the
9 minimum at least, 40 per cent spruce, and it went back
10 into the MAD land base, in what working group would it
11 go back into the MAD land base?

12 A. The manager would have to make a
13 decision as to what forest unit it should specifically
14 go into. Depending on how that management forester is
15 calculating his or her MAD, they may have a mixed
16 conifer forest unit or they may not and, therefore, the
17 manager would have to make a decision to put those
18 hectares that have been declared free to grow in one
19 forest unit, whether it be jack pine or black spruce.

20 Q. But if it met the stocking standards,
21 if it met the free to grow standards for black spruce
22 and you planted black spruce, would it not
23 automatically got into the black spruce working group?

24 A. Yes, it would.

25 Q. And if it didn't meet the black

1 spruce free to grow standards and you planted black
2 spruce, but had that 30/30 mix that you indicated - 30
3 per cent jack pine, 30 per cent spruce - you say it
4 would go into the mixed working group.

5 A. It would go into the mixed conifer
6 forest unit, if the author of that plan had identified
7 such a forest unit.

8 Q. And if it went into the mixed conifer
9 forest unit, is a maximum allowable depletion
10 calculated for all of the areas which are in that
11 forest unit that is conifer?

12 A. That's correct.

13 Q. And a separate MAD calculation would
14 be done for the spruce forest unit?

15 A. That's correct, if the manager broke
16 up his forest units in that manner.

17 Q. Can there be deviations from the
18 stocking standards which are referred to on page 177
19 and all the other pages in here which are similar?

20 A. Well, if we turn to page 178 which is
21 the second page of the free to grow standards for the
22 northwestern region, I think we have the answer right
23 there.

24 You look it at the first line, benchmark
25 standards, it says:

1 "These standards are intended as a guide
2 for minimally acceptable forestry
3 practice. Standards for individual
4 forests may be different and must be
5 explained in the management plan."

6 So, therefore, subject to peer review and
7 the approval process, a local manager could put forward
8 an argument for a standard that is different and if it
9 was accepted, then on that management unit the free to
10 grow surveys would compare to those standards for that
11 management unit.

12 Q. And you indicated to the Board
13 earlier that the stocking which -- the stocking
14 standards, the minimum and the desirable or the
15 objective, in fact, is a requirement in Table 4.11 of
16 the Timber Management Planning Manual?

17 A. That's correct.

18 Q. And if the numbers which were put
19 into that part of the Timber Management Plan differed
20 from the standards which appear in the regional free to
21 grow benchmark standards would an explanation of the
22 difference be required?

23 A. That's correct. And if the
24 explanation was not reasonable, then there would a
25 different number put in that table.

1 Q. And is the explanation of the
2 difference between what goes in the plan and what the
3 standards say to be indicated in writing in the Timber
4 Management Plan?

5 A. I do not know if it says that
6 specifically in the manual at this point in time, but
7 if someone is considering having standards that are
8 different from the benchmark standards then that is the
9 only way they will get them.

10 Q. Okay. Now, if we go back to page 177
11 and we looked at the mixed conifer, and we go over to
12 the third column, it has got objective stocking and
13 there is nothing indicated there.

14 Are you aware of what the implication of
15 that is?

16 A. I talked with the regional planning
17 specialist in Kenora and the inference was that, No. 1,
18 that means not applicable and in the northwest, where
19 they are planting conifer, their objective is to plant
20 spruce on a given site and, therefore, they expect it
21 to come back in the spruce forest unit.

22 As well, their objective may be to plant
23 jack pine or seed jack pine and, therefore, their
24 objective is to have that come back in the jack pine
25 forest unit. They are not planning on having mixed

1 conifer stands, they are not trying to have them come
2 back. And, therefore, it is only by not being
3 silviculturally successful do they anticipate declaring
4 stands free to grow in the mixed conifer unit and,
5 therefore, they do not have an objective.

6 Q. Okay. Could you turn to page 179,
7 the north central region's free to grow benchmark
8 standards. Looking at spruce and going across the
9 third column, the free to grow minimum stocking, they
10 have N/A next to natural. Can you advise what the
11 reason for that and the absence of a minimum stocking
12 standard is?

13 A. Again, not exactly the same logic as
14 was used in the northwest, but what they recognize
15 relative to the forest conditions they were dealing
16 with was that where they left an area that was
17 predominantly spruce originally to come back as natural
18 regen, as well looking at jack pine where it was
19 predominantly jack pine originally, where they didn't
20 carry out any artificial regeneration treatment, they
21 anticipated on such sites that there would be a mix of
22 species coming back and, therefore, they felt that in
23 these standards relative to how that region was looking
24 at free to grow it was not necessary to have a number
25 there.

1 But they did allow for that in what they
2 call their jack pine/spruce mix where they do have the
3 renewal treatment listed as natural and they do have a
4 minimum stocking standard there.

5 Q. Okay. Can you turn to page 183,
6 please. The northeastern region's free to grow
7 benchmark standards start on that page. This
8 particular free to grow standard is different in a
9 number of respects.

10 Firstly, in the second column, renewal
11 treatment, reference is made to a category called elite
12 addition to the three treatments which are identified
13 in the other standards we have looked to.

14 Can you advise what the reference to
15 elite means?

16 A. That recognizes that in the future we
17 will be having, as we do have now, different levels of
18 investment on a site and what they mean by elite
19 renewal treatment is that we will be planting that site
20 with stock that's genetically improved, sort of our
21 best trees and they just have made an allowance for
22 that.

23 And if you look closer in the second one
24 is says plant and that's the same plant that they use
25 in the northwest. In the northwest they recognize

1 different levels of investment on sites, if you look at
2 the spruce forest unit on page 177 and, as well, they
3 have gone a little further in the northeastern and
4 recognized a higher level of investment called elite.

5 I would assume that the reason they
6 didn't recognize it in the northwest is that at this
7 point in time that is not happening and, obviously, if
8 they do start planting a lot of genetically improved
9 stock at that point in time or when they have some
10 other silvicultural improvements, they may make
11 modifications to their standards.

12 Q. If you look at the fifth column it is
13 called competitive position. So these particular
14 standards have a stocking, a minimum height and a
15 competitive position identified in them for various the
16 types of renewal treatments. The other ones we looked
17 at did not.

18 Are you aware as to why northeastern put
19 this information in their standards or, putting the
20 question another way, why the other regions we looked
21 at did not?

22 A. I do not know why the other regions
23 did not. I believe what they were doing in the
24 northeast and, as well as you move farther into
25 southern Ontario you will see the standards seem to get

1 more and more complex. They were reflecting the
2 history of silviculture and in southern Ontario we have
3 tended to be at it a little longer and, as well, in the
4 northeastern region all you are doing is providing a
5 little more information to the manager to aid that
6 manager in making the declaration.

7 There are still only three criteria that
8 must be met for an area to be declared free to grow, a
9 minimum stocking level, a minimum height and freedom
10 from competition and they were providing the manager a
11 little more information.

12 Q. And an example of perhaps a little
13 bit more information is found on page 185 where we look
14 at the Algonquin region's standards and they have two
15 columns again which are different from all of the
16 proceeding ones. They have a second column site class
17 and they have got as the second last column height
18 increment?

19 A. Yes. Well, what happens, we are
20 basically dealing in the Algonquin region with a
21 different forest in very simple terms. We are dealing
22 with a forest that tends to have different conifer
23 species. The white pine is more prevalent versus jack
24 pine in northern Ontario. As well, we are dealing with
25 a forest that has a higher component of tolerant

1 hardwood species such as maple.

2 Q. Than does the boreal forest?

3 A. Than does the boreal forest.

4 Q. And why is that the explanation for
5 the site class designation and the height increment
6 designation?

7 A. Because of their experiences, they
8 felt with the forest they were dealing with that site
9 class was a reasonable way to divide the forest units
10 for a given species. For example, if you turn to page
11 186 --

12 Q. What page I am sorry?

13 A. Page 186.

14 Q. Yes?

15 A. If you look at the yellow birch
16 forest unit, the BY forest unit, the second major area
17 you will note that they have recognized that there are
18 differences in sites and they have recognized that
19 fresh sites versus moist sites that they prefer certain
20 species and that will be based on their experience with
21 seeing those species grow on wetter sites versus dryer
22 sites, fresh sites versus moist sites.

23 What we have to recognize is the forest
24 is different and we are dealing with different
25 individuals and what I think you will see over time -

1 and this is the first time we have had regional
2 benchmark standards - and what I think you will see
3 over time is perhaps not as an extreme a variation as
4 perhaps you believe you are seeing here when you look
5 at these tables for first time.

6 Q. Can a survey result which indicates
7 you have been silviculturally ineffective be used for
8 any positive purpose?

9 A. Yes. No. 1, you can make a decision
10 to do an additional treatment so that you, in general,
11 will be silviculturally effective. More importantly,
12 what you are going through by recognizing that is a
13 learning experience and, therefore, you would consider
14 making modifications to future treatments and perhaps
15 the best way to do that - I'll talk about that - is
16 give you an example.

17 We were carrying out stocking assessments
18 on the Steel River Crown management unit relative to
19 areas that were planted and in my estimation the area
20 was not sufficiently stocked and we decided the reason
21 it was not sufficiently stocked was because of the
22 site-preparation equipment we were using for the site
23 and so, therefore, we made the decision to move towards
24 a different piece of equipment which would prepare the
25 ground better and, therefore, allow us to plant more

1 trees per unit area and, therefore, the potential for a
2 higher stocking level was increased.

3 Q. I understand, Mr. Gordon, that you
4 are going to describe some specific survival surveys
5 which have been done, the results of some specific
6 survival surveys; is that correct?

7 A. That's correct.

8 Q. And what survey results will you be
9 describing?

10 A. I will be describing some survival
11 results from five forest units spread across northern
12 Ontario and, as well, some provincial summaries of
13 survival results for a certain period of time.

14 Q. I understand the documents that you
15 will be referring to begin at Document No. 20 which is
16 found at page 196?

17 A. That's correct.

18 Q. and the paragraphs in the witness
19 statement that cover this particular area are
20 paragraphs 40 to 42?

21 A. That's correct. Perhaps, Mr.
22 Freidin, if we can go back just a moment--

23 Q. Yes?

24 A. --and cover a couple of other things.
25 What I have tried to do so far is explain a number of

1 survey types and explain the number of concepts;
2 stocking, survival, free to grow and I think it would
3 be beneficial at this time to do a very quick summary
4 by using Document No. 19 which shows the spatial
5 relationship of these assessments.

6 If we could turn to page 195, it might be
7 a beneficial summary before we go into results.

8 What we are attempting here to show in
9 this diagram is how the different surveys relate and as
10 you move from the left-hand side, you have got a
11 forest, an old forest which is being harvested and then
12 you plant some trees and over time, obviously, they
13 grow.

14 You carry out condition surveys
15 throughout the period that forest is growing, up to the
16 time that it is harvested. You tend to carry out
17 survival surveys in year one to two, although you may
18 carry them out at six months or five years.

19 You tend to carry out stocking surveys in
20 year five and, as you can see by looking at the
21 regional free to grow benchmark standards, we will be
22 carrying out ever increasing amounts of free to grow
23 assessments running from years 5 to 12 depending on the
24 species you are dealing with.

25 As the trees are moving towards free to

1 grow not only are you carrying out survival stocking
2 and -- survival and stocking assessments, you are also
3 determining whether or not there are any tending needs
4 or any protection needs and we also have to recognize
5 that after an area is free to grow, for that next 40 to
6 60 years, we still will be on occasion going back to
7 check and see how they are doing, what is the condition
8 of that stand.

9 And so potentially, and I do not
10 anticipate it happening on a lot of sites, but
11 potentially when an area is free to grow and you make
12 that determination that it free from competition you
13 may go back a number of years later and on a small
14 percentage of sites, by doing a tending assessment, you
15 make look at competition and you make a decision that
16 competition has re-appeared on that site and to ensure
17 that that stand remains free to grow you may decide to
18 carry out a treatment.

19 And one other comment before we get into
20 the specific results that you want to talk about. We
21 decided that for the Board's information we should do
22 so, and that is why we have these results.

23 However if I could draw the Board's
24 attention to paragraph 40 on page 31. We have tried to
25 make it perfectly clear that what we are doing is

1 presenting an example of survival results and some
2 other results and the reason we can't provide a
3 comprehensive package is, as we say, in paragraph 40:

4 "Funding constraints have limited full-
5 scale data collection survival surveys
6 and regeneration effectiveness."

7 So while we would like to present to the
8 Board a comprehensive summary of all results on all
9 management units we can't do so and, therefore, we made
10 the decision to go out to five management units and
11 look at the survival results and bring those results to
12 the hearing.

13 Q. And those five management units which
14 you went to are described on page 196, I understand?

15 A. That's correct, I believe.

16 Q. The five management units are listed
17 on the left-hand side of the page and they are
18 indicated geographically by the various designations,
19 cross-hatching, et cetera in the appropriate location?

20 A. That's correct and we are dealing
21 with the Red Lake Crown management unit in the
22 northwest region, the Brightsand management unit, the
23 Kapuskasing Crown management unit as we move towards
24 the clay belt and into the clay belt, the Plonski
25 Forest and the Georgian Bay management unit in the

1 Algonquin region. And our objective was to sample
2 across northern Ontario and, as you can see by the
3 spacial distribution on the map, that we go right
4 across the area of the undertaking.

5 Because of time constraints, et cetera,
6 we limited it to five units and the major criteria that
7 we used in deciding which units we would look at was
8 not the units with the best results but the units which
9 we felt had the best records. So, therefore, we could
10 go and find numbers and add them up and put summaries
11 in front of you.

12 Q. All right. Could you then proceed,
13 Mr. Gordon, and indicate to the Board the results or
14 major conclusions of the analysis that you did?

15 A. For the Board's information, if we
16 turn to page 198, at the bottom of the page we present
17 a summary that describes the different tables of
18 numbers that follow page 198.

19 Table No. 1 is the second-year survival
20 rates for all five forest units combined. Table No. 2
21 was second-year survival rates for each individual
22 forest units and that means that there are basically
23 five table 2's because we are dealing with five
24 management units.

25 Table No. 3 we have gone a little further

1 than Table No. 1, we have segregated the information
2 out into two different decades to see if we could note
3 anything, and Table No. 4 does the same by individual
4 management unit.

5 And while there is a lot of good
6 information there what I would recommend we do is move
7 forward and look at page No. 205, Table No. 3 which
8 shows the breakdown by decade, I believe species where
9 records were found. And, as you can see - and perhaps
10 I will just highlight some of the species - if you look
11 on page 205 at jack pine under bare root, the survival
12 for jack pine second year for the decade 63-73 was 83
13 per cent, and for the next decade 74-84 it was 84 per
14 cent, consistently good results.

15 For black spruce you can see for the
16 first decade, 58 per cent and for the second decade 80
17 per cent. And for white spruce, a similar trend on
18 those five management units, 56 per cent in the first
19 decade and 58 per cent in the second decade.

20 And we go down to containers for jack
21 pine you see a similar result for -- excuse me, when we
22 go down to containers, when we go down to jack pine we
23 see a similar result, consistently good results, 82
24 versus 86 per cent.

25 For black spruce you see a fairly low

1 survival rate as of two years, 58 per cent in the first
2 decade, 77 per cent in the second decade, an increase.
3 And white spruce, it is my understanding that sample
4 size is very, very small, we planted a number of -- a
5 very small number of white spruce containers in 63-73
6 and that is not a normal practice on those units, in
7 the second decade.

8 What you tend to see there in my
9 estimation is a trend either that things are relatively
10 well throughout that time period or there has been some
11 improvements.

12 MR. MARTEL: Could I ask what the 83 -- I
13 think we had a discussion with Mr. Armson some weeks
14 ago about survivals; is this what we were talking
15 about, the actual -- and I think we were told that
16 survival, a percentage meant nothing.

17 I think that is what was said, I could be
18 wrong, and yet that is what we seem to be dealing with
19 here and I don't want to get confused.

20 MR. ARMSON: Believe if I recollect, Mr.
21 Martel, the per cent survival without being taken -- if
22 you are looking at it in relation to management
23 objectives you should know what the management
24 objectives are. But I believe that in our discussion,
25 when you asked me, I agreed that if the taxpayer, for

1 example, was paying to produce trees to be planted,
2 then there was a legitimate question that might arise
3 as to whether, if there were a hundred million trees
4 produced at some cost, how many of those in aggregate
5 survived. And I agreed with you on that point, that
6 the aggregate per cent survival then had some meaning.

7 Here we are looking in terms of the two
8 decades and at aggregates, in effect, but on a unit
9 basis and I think, as Mr. Gordon has pointed out, that
10 with some exceptions they show an improvement or an
11 increase in the per cent survival in the second decade
12 over the first.

13 MR. GORDON: And I don't want to mislead
14 the Board, you know, if you ask me what the sample size
15 is here, you know, we are talking about records that go
16 back to 1955 and I can't tell you it is based on a one
17 per cent or two per cent or five per cent sample.

18 So all I am saying to you is that it
19 appears to indicate an improvement, a trend. I really
20 have no further comments on that one, Mr. Freidin.

21 MR. FREIDIN: Q. I am sorry, you made a
22 summary of the provincial picture as well?

23 MR. GORDON: A. That's correct. And if
24 you turn to page 212 in Document 23, what you see here
25 is data from the provincial silvicultural assessment

1 system where we have aggregated the survival results
2 provincially and, for example, when you look at the
3 first species, white pine --

4 Q. And this particular table is for the
5 provincial summary of second-year survival rates for
6 the years 81-87 for bare root?

7 A. That's correct, that's correct. The
8 next table will be dealing with container stock.

9 But what you can see there is the
10 survival rates for a number of years and, specifically,
11 because it is more recent, you can see the actual
12 numbers of trees involved in the sample. And so when
13 you look at white pine, the average survival rate
14 second year for those number of years is 80 per cent.
15 And that 80 per cent survival rate is based on going
16 and looking at 116,220 trees; that is, there was a pin
17 besides those trees out there in the cut over and
18 someone went back and looked and saw whether the trees
19 were living or not.

20 And as you can see in the species of
21 interest in northern Ontario, jack pine, the average
22 survival in that period was 85, and for black spruce
23 81.

24 If we go to page 213, where we are
25 looking at an aggregation of survival rates, second

1 year, for the same period of time for container stock,
2 we see relatively good results, in my estimation. It
3 varies from an average of 82 per cent for white pine
4 based on a relatively small sample, versus 91 per cent
5 for red pine and white spruce.

6 And if we turn to page 214, what I have
7 done here is pulled some of these specific numbers in
8 those previous tables, the five years' averages and put
9 them there so it is easier to follow them and you can
10 see that jack pine is consistently, whether it is bare
11 root or container, in the mid-80s or higher, black
12 spruce again in the 80s, white spruce in the 80s, all
13 species in the 80s and while I have presented numbers
14 for containers there for white spruce, white pine and
15 red pine, but what we have to recognize is that that is
16 a very small sample size.

17 Q. And do those numbers indicate any
18 change from the earlier years that you sampled?

19 A. Yes. I think I have an overhead, if
20 you can just give me a moment, please.

21 What I have done here is in the first two
22 columns I have taken the numbers exactly as they are
23 from the sample of applied forest management units in
24 this column here and this column here, and then I have
25 put beside them the results of the provincial summary

1 and what you can see is a trend that at least we are
2 maintaining the same survival rates or they are going
3 up.

4 Based on the sample that was taken, black
5 spruce is consistently in the mid-80s, 83, 84, 85.
6 Black spruce you can see a large increase from the
7 mid-60s when we are just getting going in timber
8 management versus the present time in the 80s and, as
9 well, similar with white spruce you can see the same
10 friends. Relatively low second-year survival rates
11 increasing over time.

12 For containers, jack pine again a slight
13 increase over time, jack pine -- I mean, excuse me
14 black spruce, similarly the same result, however, a
15 much more dramatic increase from back in the 60s.
16 White spruce it should be more. It is a relatively
17 small sample size.

18 So what I am trying to say here is you
19 see a trend of improvement, you definitely don't see
20 the numbers going the other way.

21 MRS. KOVEN: What is the difference in
22 costs between using bare root stock or container stock;
23 is container stock much more expensive?

24 MR. GORDON: Just give me a moment to
25 think about that while I walk back. It has been a few

1 years since I have been involved directly in the costs,
2 however, usually when you are preparing an area -- are
3 you just asking about the cost of the trees themselves?

4 MRS. KOVEN: I was curious because it
5 seems to me that the survival rates for the container
6 stock are just marginally higher than those for the
7 bare root stock and I wondered if the difference in
8 cost justified that or whether they were comparable?

9 MR. GORDON: Off the top of my head, I
10 don't know the exact costs of producing bare root stock
11 versus container stock.

12 Mr. Cary?

13 MR. CARY: Perhaps I could tell the Board
14 that on average container stock costs a little bit more
15 produce per thousand, in the order of 20 or \$30 more,
16 however, the planting operation is the one that you
17 should consider and there has to be site preparation
18 and there has to be planting costs too.

19 So there is very little difference when
20 you add up the three costs, of site preparation
21 planting operation and the costs of stock production.

22 MR. FREIDIN: Q. And are you able to
23 advise, Mr. Cary, are all sites which are planted a
24 good site for both container and bare root or are there
25 some situations where it is preferable or advisable to

1 use one as opposed to the other?

2 MR. CARY: A. We carefully select sites
3 for bare root planting and container planting, yes.
4 Site differences will usually dictate what plant --
5 what type of stock we plant.

6 Q. Thank you.

7 MR. GORDON: A. And perhaps I can add a
8 very simple example of that, Mr. Freidin, is you have
9 made the decision that you want to plant an area, and
10 let's assume all other things being equal the only
11 difference in the sites is the depth of soil, on one
12 site you have got enough dirt there to get a big shovel
13 in and plant a bare root tree with a larger root system
14 so, therefore, you plant bare root on that site.

15 On another site the soil is shallower
16 and, therefore, you would plant a smaller container
17 because you could get that root system in the container
18 into the ground where it could survive, the planting
19 would be easier.

20 Q. And if I could just refer you to page
21 198 of the witness statement, at the second page of a
22 short paper dealing with the analysis of second-year
23 survival data, which you have just dealt with.

24 Would you go to the second paragraph on
25 page 198, I think it indicates that the second-year

1 survival does not indicate the overall amount of
2 regeneration on a site since only the planted trees are
3 measured. The procedure does not take into account the
4 establishment of volunteer trees.

5 And I would just like you to explain what
6 you meant by volunteer trees?

7 A. As I described, when you are setting
8 up an area that will be assessed in the future for a
9 survival assessment, you put pins in beside the trees
10 that you planted and when you go back to do the
11 survival assessment of those planted trees, you do not
12 consider in the survival number percentage the trees
13 that may show up naturally between the tree that you
14 actually planted and those trees that show up naturally
15 between the trees that you planted are what we call
16 volunteer trees.

17 MR. FREIDIN: Mr. Chairman, what are your
18 thoughts about a break today. I am going to start a
19 new area of the last type of survey.

20 THE CHAIRMAN: Perhaps then it would be
21 advisable to break for lunch at this time.

22 And, as I mentioned yesterday, it is the
23 Board's intention to go probably until about 3:30 or a
24 quarter to four.

25 MR. FREIDIN: I thought it was 2:30.

1 THE CHAIRMAN: That is okay.

2 So why don't we break now until about one
3 o'clock. Will that be enough time?

4 MR. FREIDIN: That is fine.

5 THE CHAIRMAN: And start at one again.

6 Thank you.

7 ---Luncheon recess at 11:50 a.m.

8 ---Upon resuming at 1:00 p.m.

9 THE CHAIRMAN: Thank you, ladies and
10 gentlemen. Please be seated.

11 If we can just wait a moment, Mr. Freidin,
12 until somebody from Mr. Tuer's group arrives.

13 MR. FREIDIN: Q. Before we move onto NSR
14 surveys, Mr. Gordon, I am just wondering: Could you
15 advise what is the reason that you made the effort of
16 actually providing comparative survival rates over the
17 three periods bringing the Board up to the present,
18 when the evidence that you gave earlier this morning
19 was that good survival rates cannot be equated to
20 achieving regeneration effectiveness?

21 MR. GORDON: A. What I tried to say in
22 my evidence this morning was that now and in the future
23 the standard that will tell us whether or not we are
24 having an effective program relative to regeneration is
25 free to grow, and free to grow is a relatively new

1 concept and we have limited data available relative to
2 the free to grow concept.

3 While I did downplay the relevant
4 importance of second-year survival data I still thought
5 we should put some data in front of the Board for their
6 information.

7 Q. Thank you. The last survey that you
8 are going to deal with in this part of the evidence are
9 dealt with in paragraphs 43 to 45 of the witness
10 statement, Document 24-26 and we are dealing here with
11 not satisfactorily regenerated surveys which I
12 understand usually are referred to as NSR surveys?

13 A. That's correct.

14 Q. Can you advise the Board what an NSR
15 survey is?

16 A. NSR surveys are surveys carried out
17 prior to the signing of forest management agreements
18 and they are, in effect, a free to grow survey and they
19 are one of the few free to grow surveys that have a
20 reasonable amount of data that goes back for a number
21 of years and that's why we are presenting such data.

22 The the purpose of a free to grow survey,
23 if we can turn to page 215 and Document 24, if we look
24 at the bottom of page 215 there is two major reasons
25 for carrying out an NSR survey before you sign an FMA:

1 No. 1 is to determine what areas should
2 be included in the maximum allowable depletion land
3 base; i.e., the areas which are free to grow and, No.
4 2, to determine what the FMA holder's obligations will
5 be relative to treating certain areas that are
6 economically treatable and I will be coming back to
7 that.

8 And basically what you do is you survey
9 the barren and scattered areas and the 1-20 age-class
10 as identified by FRI and, as well, areas that have been
11 recently depleted by harvesting or fire, et cetera.

12 Q. And by whom is this survey done?

13 A. The survey is carried out jointly by
14 the Ministry of Natural Resources and the prospective
15 FMA holder.

16 Q. And you indicate that we will back to
17 the purpose which is sub (b) to determine the FMA
18 holder's obligation to treat areas which are
19 economically treatable during the first 20 years of the
20 agreement?

21 A. That's correct.

22 Q. Is there a requirement that all areas
23 which are not free to grow, based on this survey, must
24 be treated and made free to grow regardless of the
25 cost?

1 A. No, there is no such requirement.

2 One of the major things looked at in this survey is if
3 an area is not free to grow can it be brought into the
4 free to grow status within a reasonable period of time
5 at reasonable cost; i.e. is it economically treatable.

6 THE CHAIRMAN: Is the cost predicated on
7 the ability of that particular FMA holder or is it an
8 across-the-board economic assessment?

9 MR. GORDON: What happens there is, No.
10 1, the costs are relative to that individual FMA and
11 what happens is the Crown and the prospective FMA
12 holder basically review Crown projects that have taken
13 place in the past years and basically conclude as to
14 what is economically treatable, what sites can you
15 treat with the currently available equipment, et
16 cetera.

17 And then they go look at the areas that
18 are not free to grow and make a decision as to whether
19 or not you can treat those sites at a reasonable cost;
20 i.e., relative to unit costs that were used last year
21 or do you need to spend a lot more money to bring that
22 area to free to grow.

23 THE CHAIRMAN: I guess what I am asking,
24 from what you are saying, it doesn't have anything to
25 do, therefore, with the economic viability of that

1 particular FMA holder? In other words, if they are
2 having a particularly bad year market-wise, is that
3 taken into account in terms of determining what they
4 have to do or not?

5 MR. GORDON: No, no. And, of course, the
6 reason being is once - we will probably come around to
7 this again - once the Crown and the prospective FMA
8 holder agree what is economically treatable those
9 numbers are written into the FMA agreement and the FMA
10 holder then is required to treat a certain number of
11 hectares over a 20-year period and the Crown pays for
12 that treatment.

13 THE CHAIRMAN: Thank you.

14 MR. FREIDIN: Q. And I understand that a
15 definition of economically treatable was prepared in
16 answer to an interrogatory asked by the Ministry of the
17 Environment.

18 MR. GORDON: A. Yes, that's their
19 Question No. 15.

20 Q. And perhaps rather than filing a copy
21 of that document, I will just read the question:

22 "Paragraph 44, page 33 of the evidence
23 uses the term economically treatable.
24 Please provide a definition of
25 economically treatable."

1 Would you, please, read it in for the
2 record, Mr. Gordon, the answer which was provided?

3 A. As per page 5 of the document
4 entitled:

5 "Manual for the Survey of Not
6 Satisfactorily Regenerated (NSR) Lands,
7 NSR 2 class lands are those which are not
8 satisfactorily stocked but require
9 tending treatments. NSR class 3 lands
10 are those lands which can be treated at
11 current unit cost levels. Within the
12 context of these surveys, such areas
13 which can be treated at current unit cost
14 levels are considered to be economically
15 treatable. This manual is provided to
16 you in response to interrogatories of
17 Panel No. 3, your Question No. 6."

18 Q. Now, you indicated that there were
19 various classes of NSR land. You refer to NSR 2 and
20 then NSR 3 and then stated within the context of these
21 surveys, such areas which can be treated at current
22 unit cost levels are considered to be economically
23 treatable.

24 Could you advise or describe the
25 classification system that is used to describe the

1 results of the survey, the NSR survey that is done?

2 A. Yes, if we could turn to page 216 in
3 Document 24. There are six classes a third of the way
4 down the page: Category No. 1. You have the areas
5 that have been surveyed and considered satisfactorily
6 regenerated, basically they are and they are declared
7 free to grow.

8 Q. So just stopping there. Although the
9 results of the not satisfactorily regenerated survey
10 indicates that certain areas are free to grow, that
11 area is given a designation of Category 1 for not
12 satisfactorily regenerated areas?

13 A. That is correct. Areas in this
14 survey that are free to grow are called NSR 1 for a
15 brief period of time and then they move into the
16 inventory.

17 Q. But they are in fact satisfactorily
18 regenerated?

19 A. Although we have put the label on
20 them NSR 1.

21 Q. Thank you.

22 A. That's correct.

23 THE CHAIRMAN: Is there any rationale to
24 that at all? Mr. Armson?

25 MR. ARMSON: Yes.

1 THE CHAIRMAN: I assumed there was.

2 MR. ARMSON: And I must admit some
3 personal responsibility. It is common in scientific
4 endeavours, where you have a category, for example in
5 soils, there is a category relating to soils which is
6 commonly used throughout the world, structure, that is
7 a property.

8 One of the first categories under
9 structure is a structureless. The logic, therefore,
10 when we did an NSR survey to have a series of NSR
11 categories was to have the breakout. The first
12 category was Category 1, satisfactorily stocked, called
13 NSR 1.

14 THE CHAIRMAN: And is that structure, if
15 I can use the word, known to anyone other than
16 scientists? Is it the type of thing that anybody
17 reading the documentation would reasonably be expected
18 to understand the rationale therefore?

19 MR. ARMSON: I think in professional
20 areas that is not an uncommon thing, to have a category
21 and then the first category to be something other than
22 what the title would be. It may seem very illogical to
23 the general public and other people, but that's the way
24 it is.

25 MR. FREIDIN: De minimis non curat lex,

1 Mr. Chairman.

2 Q. All right, if you can continue.

3 MR. MARTEL: Can we go back to that for a
4 moment. You know, the title is: Not Satisfactorily
5 Regenerated. That's the title, okay, page 215, and
6 this is the classifications of not satisfactorily
7 regenerated.

8 You then have in Category 1 regenerated
9 to satisfactory stocking and; i.e., free to grow. That
10 doesn't really make much sense; does it?

11 MR. ARMSON: If I may, Mr. Martel. The
12 purpose - going back - was the survey was an NSR
13 survey and I suppose your logic is correct that within
14 the NSR survey it might have been more appropriate to
15 label the first category satisfactorily regenerated. I
16 mean, I have no problem with that kind of logic, it is
17 just that this is the way it was done.

18 MR. MARTEL: But I think the Chairman is
19 right. For the lay public to read this, they would
20 consider that an area that isn't satisfactorily
21 regenerated just from the title: Not Satisfactorily
22 Regenerated.

23 MR. ARMSON: I would submit, Mr. Martel,
24 it wasn't written for the lay public at all.

25 MR. MARTEL: Well, since the lay public

1 pays our way maybe they would like to understand what's
2 going on. That's a possibility; isn't it?

3 MR. ARMSON: Well, I think it can be made
4 understandable.

5 THE CHAIRMAN: Well, let's approach it
6 this way: Is it not possible and is it not proper to
7 have a set of documentation that is primarily used for
8 the experts or the professionals in the field that
9 should, by necessity, be more precise in terms of
10 scientific terminology and, therefore, more
11 understandable by them in terms of being able to
12 precisely categorize the information therein; and a
13 second set of documentation which might be the
14 documents available for the lay public in a form more
15 understandable by them and perhaps that would require
16 some kind of cross-referencing between the two.

17 But I appreciate, I think Mr. Armson your
18 suggestion, that if this is the way the scientific
19 community specifies something in particular and it
20 affords a much greater degree of specificity, then
21 perhaps there is nothing wrong, provided that that is
22 not the documentation that others, apart from the
23 scientific community, would be relying upon.

24 MR. ARMSON: I would agree with you, Mr.
25 Chairman. I think, as I say, there was never any

1 intent that the NSR survey manual, or document that was
2 prepared in 1979 be a public document. Not because it
3 couldn't be read but because it was not aimed in that
4 direction and I think the second set of information
5 relating to it would be perfectly justifiable.

6 MR. MARTEL: I think there is another
7 reason. If you expect the public to participate in the
8 FMAs and in a variety of ways as you have shown us for
9 the past two or three months they have to understand or
10 they can't participate in a meaningful way.

11 MR. ARMSON: I agree, however, if they
12 wish to read the document -- I think what you are
13 saying is if they look at in a cursory manner they may
14 have the wrong impression. If they wish to read it,
15 they will have the meaning very clearly spelled out.

16 THE CHAIRMAN: Okay. Why don't you
17 proceed, Mr. Freidin.

18 MR. FREIDIN: Q. Mr. Gordon, can you
19 then continue on to describe the other categories of
20 the survey results, all of which I understand apply to
21 areas which in fact did not qualify as being free to
22 grow?

23 MR. GORDON: A. That's correct. The
24 next category is NSR 2, Category 2 and those are areas
25 that have satisfactory stocking on them but they were

1 not free from competing vegetation, so that they didn't
2 meet that third criteria for free to grow and usually
3 they require a tending treatment.

4 Category No. 3 are areas that do not have
5 satisfactory stocking, however, in the estimate of the
6 surveyors they can be treated at a reasonable cost they
7 are economically treatable and by spending such monies
8 we can bring them into the free to grow status in a
9 reasonable period of time.

10 Q. And when you referred earlier to
11 areas being economically treatable, is the area upon
12 which you make that assessment, does that refer to the
13 Category 2 and 3?

14 A. That is correct.

15 Q. So in the case of 2, because it could
16 be usually requiring a tending treatment, the cost of
17 doing that would be the cost to the Crown, it would be
18 estimated to be the cost to the Crown to have someone
19 actually perform that sort of tending?

20 A. It would be the cost of carrying out
21 that treatment.

22 Q. Yes, okay.

23 A. You go further in your assessment and
24 you may find some areas that are not free to grow and,
25 well, can not be treated at a reasonable cost and these

1 areas are classified as Category 4 or Category 5.

2 Category 4 are areas that are not
3 satisfactorily stocked and, however, they can be
4 brought through to free to grow status by spending more
5 money and it is estimated 50 to 100 per cent above the
6 normal unit cost.

7 Category No. 5, the areas again are not
8 satisfactorily stocked and in the estimates of the
9 surveyors cannot be treated using existing technology
10 and they further have subdivided that category into two
11 parts, A and B.

12 As you will see on the top of page 217,
13 the costs may be specifically excessive because there
14 is no access, or the costs may be excessive even though
15 there is access but there may be terrain problems or
16 technological problems.

17 And then there is a sixth category which
18 basically is a holding category and these are areas
19 that have very often been depleted in the past five
20 years and it is too early to make a free to grow
21 assessment.

22 And, as well, although it is not shown in
23 this Category 6, in this document, it is also the
24 holding category for areas that are almost free to grow
25 and that is satisfactory stocking, they are free from

1 competition but they don't have enough height.

2 Q. Now, you indicated at the beginning
3 of your evidence that you would come back to the
4 treatment obligation of FMA holders being identified in
5 the forest management agreement. Could you describe
6 for the Board what that treatment obligation on the FMA
7 holder is in relation -- which arises as a result of
8 NSR surveys?

9 A. Through the NSR survey you identify a
10 number of hectares and the NSR 2 and NSR 3 classes.
11 You total those number of hectares tars up and that
12 gives you the total that's considered reasonable
13 treatable using present day unit costs and the FMA
14 holder is required to treat those areas over the first
15 20 years of the FMA at a rate equivalent to 5 per cent
16 per year.

17 Q. Now, you indicated that an area is
18 calculated for the lands which fall into Categories 2
19 and 3?

20 A. That's correct.

21 Q. And is it the obligation of the --
22 well, are the results of NSR survey mapped?

23 A. Yes, they are.

24 Q. and what would one see if they were
25 looking at a map?

1 A. They would see a map with the stands,
2 project areas outlined with different categories from 1
3 to 6.

4 Q. So the map would indicate the area
5 surveyed and the map would indicate whether an area was
6 Class 1 through 6.

7 A. That's correct.

8 Q. Going back to the area which you have
9 calculated for those areas which were classified as NSR
10 2 and 3, is the obligation on the FMA holder to treat
11 those areas which were actually identified as being NSR
12 2 and 3?

13 A. What we have to recognize is this is
14 a survey and the actual obligation of the FMA holder is
15 to treat an area equivalent to the area identified as
16 being NSR 2 and 3. So, therefore, the FMA holder has
17 some flexibility to move outside those areas that are
18 classified as NSR 2, NSR 3 as a result of the survey.

19 And the reason, of course, you would
20 allow for that flexibility is, as they are moving
21 towards carrying out a treatment it is going to cost
22 money that will take a much closer look at the hectares
23 involved. And some of those hectares that were
24 classified as NSR 2 may, over a a period of years,
25 become free to grow and so, therefore, they will treat

1 some other hectares.

2 Q. And when must the FMA holder treat
3 these areas?

4 A. Within the first 20-year period.

5 Q. Just so there is no question about
6 it, what total area then must be treated by an FMA
7 holder within the first 20 years of the agreement?

8 A. The FMA holder must treat an area
9 that is equivalent to the total area that was
10 identified as NSR 2 and 3 in the NSR survey.

11 Q. And you have identified Category No.
12 1 which is the area you indicated was free to grow.
13 That area would be mapped as well?

14 A. That is correct.

15 Q. And would that be useful information
16 for forest managers to know, not only how much FTG
17 there was but where it was?

18 A. Yes, it is very important for the
19 forest manager to know where different categories of
20 forest are and where the free to grow forest is, no
21 question about that.

22 Q. Thank you.

23 THE CHAIRMAN: Mr. Gordon, is the area
24 which is economically untreatable, if I can use that
25 term - or non-economically treatable, is that deducted

1 from the total areas comprising Categories 2 and 3?

2 MR. GORDON: No. Those two numbers don't
3 go together. Like, you have got a separate number for
4 Category 2, you have got a separate number for Category
5 3 because --

6 THE CHAIRMAN: And that comprises a total
7 area and supposedly the FMA holder has to treat that
8 total area 100 per cent ove 20 years?

9 MR. GORDON: That's correct.

10 THE CHAIRMAN: Now, if he comes along and
11 says within those areas there are some portions which
12 are uneconomic to treat --

13 MR. GORDON: Because of the closer look
14 or whatever.

15 THE CHAIRMAN: Whatever, is that just
16 deducted then from that total area or does he have to
17 make up that area -- does he have to make up the amount
18 that is deducted for being uneconomic with some other
19 area?

20 MR. GORDON: The obligation is to treat
21 the equivalent number of hectares to the number that is
22 identified as NSR 2 and 3 and so, in that respect, he
23 or she would have to make it up.

24 THE CHAIRMAN: From somewhere else?

25 MR. GORDON: Yes.

1 THE CHAIRMAN: Okay.

2 MR. FREIDIN: Q. Could you, Mr. Gordon,
3 or perhaps if Mr. Armson is the person to answer this
4 question, advise when is a determination made as to
5 whether an NSR treatment obligation is being met by the
6 FMA holder?

7 MR. ARMSON: A. The status of treatment
8 of NSR lands or lands identified under the NSR survey
9 and identified I believe in one of the schedules in the
10 agreement, at each five-year review, the records
11 relating to treatment are reviewed by the review team,
12 the three people that make up that review group at any
13 time, and they then would like at those areas in terms
14 of spot checking or auditing in the field.

15 The maps, related records would, however,
16 be made available to them and in the five-year -- in
17 the published five-year review there is then a table
18 which identifies the obligation and the area that has
19 been treated as part of the obligation to that date.

20 THE CHAIRMAN: Is this one of the
21 situations where if they don't do the five per cent in
22 one particular year they can make it up in another
23 year?

24 MR. ARMSON: That is correct.

25 MR. FREIDIN: Q. Mr. Gordon, are you

1 able to advise what the breakdown of NSR lands are by
2 classification 1 through 6 as a result of the NSR
3 surveys which have been done to date?

4 MR. GORDON: A. If we turn to page 219,
5 what is summarized there is some numbers from Schedule
6 B from, I believe, 29, 30 FMAs -- the first 29, 30 FMAs
7 and you can see, beginning with the Iroquois Falls, the
8 first FMA and then Lac Seul the last one on the list,
9 we have summarized the number of hectares identified by
10 class.

11 And if we go across the table you can see
12 NSR 1, the areas that were determined to be free to
13 grow; NSR 2, generally the areas that require some
14 tending treatment; NSR 3, those areas that do not have
15 enough trees out there, i.e., they are not
16 satisfactorily stocked but can be treated at reasonable
17 cost; and then NSR 4, 5 and 6.

18 I should point out you see for Category 6
19 for the first 27, 28 FMAs, that number was not recorded
20 in Schedule B and, therefore -- for those FMAs, and
21 therefore was not listed. Schedule B was my reference
22 document for that.

23 In graphical form, if we turn to page 220
24 and we have mailed out, I believe, an errata list and
25 that was included and I am assuming everybody has the

1 right copy.

2 Q. Perhaps you could --

3 A. Can we confirm with --

4 Q. All right. I believe the sheet, the
5 new sheet is page 220. It has a No. 6 in the box?

6 A. With an asterisk beside it.

7 MR. FREIDIN: With an asterisk beside it
8 and a footnote. Does the Board have that particular
9 copy?

10 THE CHAIRMAN: Yes, we do.

11 MR. GORDON: If you just use the numbers
12 from the previous table the totals and put them on a
13 pie graph this is what you end up with and basically
14 when you look at roughly 1.5-million hectares surveyed
15 approximately 65 per cent are in NSR Class 1 or free to
16 grow, roughly another 15, 16 per cent are in NSR
17 Classes 2 and 3 and then you have 4 per cent in NSR
18 Class 4 and 15 per cent in NSR Class 5.

19 MR. FREIDIN: Q. So if one does the
20 mathematics, approximately what 81 per cent of the
21 areas which were surveyed were either free to grow or
22 were in areas which had to become free to grow as an
23 FMA obligation?

24 MR. GORDON: A. That is correct.

25 Q. Does that mean, Mr. Gordon, that the

1 other areas, the NSR 4, 5 and 6 are areas which are not
2 going to regenerate?

3 A. Well, No. 1, NSR 6 is either a
4 holding category for something that's almost free to
5 grow when it puts on a little more height or it's
6 recent cut over, recent depletion so that natural
7 regeneration or artificial regeneration is taking place.
8 It is too early to assess it relative to a free to grow
9 standard.

10 The NSR 4s and 5s, at the point in time
11 that the survey was being carried out, those areas were
12 identified as being not free to grow. That does not
13 mean that over time they will not become free to grow.

14 Q. Thank you. Mr. Armson, are you able
15 to advise whether the FMA holders are meeting their
16 treatment obligations in relation to NSR lands?

17 MR. ARMSON: A. Yes. The three
18 five-year reviews that have been completed and
19 published to date would indicate that is the case and,
20 in fact, the rate for the majority of FMA holders is
21 far in excess of 5 per cent per year.

22 Q. Unless I have missed something, Mr.
23 Gordon, I believe those are the questions I have for
24 you on NSR surveys.

25 MR. GORDON: A. I think that's it.

1 MR. FREIDIN: Before we turn to the area
2 of the SOARS Study, Mrs. Koven you asked a question of
3 Mr. Cary, or of the Board about the difference between
4 container stock and bare root stock.

5 And there was -- I have asked a question
6 as to whether or not there was a difference in terms of
7 where you could plant one as opposed to the other and a
8 brief answer was given.

9 Before I move onto this area, if that's
10 an area that you would like me to deal with further
11 with Mr. Cary, perhaps expand on that comment, I could
12 do that now. But it was just something that was
13 actually raised over lunch, they felt it was something
14 that they perhaps should get into.

15 MRS. KOVEN: Is there something to add to
16 what --

17 MR. FREIDIN: I think just perhaps to add
18 the scientific basis for the distinction.

19 Q. Is that right, Mr. Cary?

20 MR. CARY: A. Well, I believe I gave you
21 an incomplete answer, so perhaps if I could go and
22 complete that.

23 Q. Well, if it was incomplete, then I
24 would ask you to make it complete.

25 A. It was a very good question and I

1 A. It was a very good question and I
2 mentioned a few cost considerations.

3 One has to consider the cost of site
4 preparation before and the cost of planting itself. I
5 also mentioned that container stock costs more to buy,
6 so to speak, and about \$20 per thousand more and that
7 would be \$20 on top of \$140 cost of bare root stock.

8 I did not mention that the bare root
9 stock cost doesn't include any capital costs. It also
10 takes longer to produce, three years, so there is no
11 interest cost in that you have to carry that cost over
12 three years.

13 When we start to make decisions about
14 that, we make them at two levels. Firstly, we can make
15 them at a provincial level and survival isn't the only
16 factor we consider in the selection. If there is a
17 need to produce stock quickly for a reason, container
18 stock can be produced in six months, while bare root
19 stock would take a minimum of three years, two to three
20 years.

21 If you had to set up added facilities,
22 you could build a greenhouse very quickly, adding to a
23 permanent nursery facility would be a long-term venture
24 and very expensive.

25 Also, at the provincial level you

1 containers is much more seed efficient than sowing a
2 lot more seed per seedling to get one seedling in a
3 bare root nursery.

4 At the management unit, Mr. Gordon
5 mentioned one factor, that you use in the selection and
6 that is the site, you are very careful as to where you
7 plant that seedling, bare root or container. Also the
8 size is important. If you are worried about
9 competition and you are planting a competition-prone
10 site you might choose bare root over container.

11 Also container stock can be held for a
12 very long period of time over the summer because the
13 root is contained and if there is a drought or a fire
14 flap or something, you can hold that stock much more
15 easily than you can bare root.

16 So there are a whole range of factors
17 that you consider in the selection, not only survival.

18 MRS. KOVEN: Do the contractors who grow
19 your seeds for you --

20 MR. CARY: Containers?

21 MRS. KOVEN: Containers and bare root,
22 are they the same contractors?

23 MR. CARY: No.

24 MRS. KOVEN: Are they financially
25 assisted, the seed container contractor?

1 MR. CARY: No contractor grows bare root
2 stock for us. The private growers all grow container
3 stock and we assist them in the capital setup of their
4 greenhouses and then in that purchase price for the
5 first five years there is an offset against the balance
6 of the capital. So we purchase stock for them for
7 planting at the field.

8 MRS. KOVEN: And the bare root producers?

9 MR. CARY: Ministry of Natural Resources
10 at its 10 provincial nurseries.

11 MR. FREIDIN: All right. Thank you, Mr.
12 Cary.

13 I am now going to move on to that portion
14 of the witness statement which begins on page 33 and
15 runs through to page 37, paragraphs 46 to 57, and the
16 document that will be referred to will be Document 27,
17 which in fact is report of some of those results.

18 I would also like to hand out at this
19 time, Mr. Chairman, a series of overheads that Mr.
20 Armson is going to use in his presentation. Like many
21 of the other overheads, it is an abbreviation or a
22 summary of some of the information which is contained
23 in the document.

24 THE CHAIRMAN: Very well. Exhibit 141.

25 ---EXHIBIT NO. 141: Series of documents relating

1 to Document No. 27.

2 THE CHAIRMAN: Are all of these
3 documents, Mr. Freidin, titled by the title at the
4 beginning of the document itself?

5 What do you want to call this?

6 MR. FREIDIN: Series of --

7 THE CHAIRMAN: Series of overheads
8 related to --

9 MR. FREIDIN: Series of overheads
10 relating to Document 27.

11 THE CHAIRMAN: Thank you.

12 MR. FREIDIN: What is the document number
13 for that, Mr. Chairman?

14 THE CHAIRMAN: 141.

15 MR. FREIDIN: 141. Just waiting for my
16 train to go by.

17 THE CHAIRMAN: Are you trying to tell us
18 that we shouldn't be sitting in the afternoon?

19 MS. BLASTORAH: Can I just ask you what
20 Exhibit 140 was? I don't seem to have it.

21 THE CHAIRMAN: 140. 140 was the.

22 MR. CASSIDY: That was MNR's answer.

23 THE CHAIRMAN: Answer to interrogatory
24 No. 4 of the Ministry of Environment's prefilled
25 evidence.

1 MS. BLASTORAH: Thank you.

2 THE CHAIRMAN: Mr. Freidin, I don't think
3 we have that yet, the actual document, or do we?

4 MR. FREIDIN: I think that was one where
5 we undertook to provide the unit breakdown and we
6 haven't been able to -- haven't gotten around to that
7 yet. I have extra copies, if anybody wants one, if
8 members of the Board want one, that is of the actual
9 interrogatory.

10 MRS. KOVEN: Yes, we only have one copy.

11 MR. FREIDIN: All right. (handed)

12 MR. FREIDIN: I can perform half the
13 task.

14 Q. All right. Mr. Armson, perhaps you
15 could begin the evidence of this particular matter by
16 just telling the Board what this survey artificially
17 regenerated area of sites is all about, what and why it
18 was undertaken?

19 MR. ARMSON: A. Yes. As the Board has
20 heard from previous witnesses, the development of
21 silvicultural in northern Ontario and particularly the
22 regeneration treatments have been one of evolution,
23 they have been one in which, as Mr. Gordon has most
24 recently indicated, the records were often those of a
25 kind that related to the immediacy of whether planting

1 stock survived, stocking measures using the 2-metre by
2 2-metre plot.

3 Often -- in fact, most often undertaken
4 by the period five years and any subsequent records
5 that were obtained concerning the subsequent
6 development were either done by individuals, unit
7 foresters or others in a rather ad hoc manner and there
8 was in, fact, no way in which if the question were
9 asked - and now we come to the purpose of the survey -
10 if we were to ask: What is the extent, the total of
11 the areas that have been artificially treated for
12 regeneration by planting or seeding, one can go to a
13 number of records, but would come up with somewhat
14 different answers. That was one of the first questions
15 that was asked.

16 The second question was to know where
17 those areas were and the third and perhaps the most
18 important one: How are those areas doing, what is
19 going on in those areas in terms of the stands that are
20 there now.

21 And so in 1984 in forest resources those
22 questions were posed and the manner of how to go about
23 that was considered and it was decided at that time to
24 undertake a comprehensive statistically-based survey of
25 planted and seeded areas in the three northern

1 regions - northern, north central and north western
2 regions - and that one of the criteria that would be
3 used for whether an area was a sample or not was that
4 it would have been, if planted, at least ten years from
5 the time of planting or, if it was a seeded area, that
6 it would have been at least 15 years from the time of
7 seeding.

8 Now, these two time frames were chosen
9 even perhaps somewhat arbitrarily but the one for
10 planting was chosen on the basis that in year 10 there
11 would likely be an expression within the area of what
12 the stand was most likely to develop in 10 years.

13 The second thing you will notice that in
14 the free to grow standards that were referred to by Mr.
15 Gordon, that in most cases the time that was considered
16 appropriate for assessing for free to grow was
17 somewhere in the 8 to 10 years, but there are some that
18 was 8 to 12 years that was generally what the
19 forester's experience considered an appropriate time.

20 With the seeding, particularly with jack
21 pine seeding, there is a small amount of black spruce
22 seeding, as you will notice, we consider that they are
23 somewhere in the order of three, maybe four years are
24 necessary to have elapsed from the time of seeding
25 before you can really make an assessment as to the

1 effectiveness of that seeding treatment. So we rounded
2 that up to 15 years. That gives you the basis for 10
3 to 15 years.

4 Now, I think Mr. Freidin I might go to
5 the overheads and perhaps go through them. The
6 material is essentially that which is in the witness
7 statement.

8 Q. Do you have a mike?

9 A. I think if I put it on the stand
10 here.

11 MR. ARMSON: Am I heard clear?

12 MR. FREIDIN: It seems that the little
13 ones with the ties have disappeared.

14 THE CHAIRMAN: I understand those were
15 the ones causing a little bit of a feedback problem.

16 MR. MARTEL: Can't afford a new one.

17 MR. ARMSON: Can I be heard there?

18 So we asked the three questions. We
19 decided then what the criteria would be for selection
20 from time of planting.

21 The first step then was to go to each of
22 the districts in the three regions and to go through
23 every available record there, whether it be one of the
24 records related to a formal survey that had been
25 undertaken and referred to by Mr. Gordon, or whether it

1 was some other form of record.

2 And I would remind the Board here that by
3 setting the time frame of planting anything up to 10 --
4 it must be 10 years, in effect we were saying that we
5 only looked at plantations that had been established by
6 the year 1974 and similarly, five years back for the
7 seeding. So that in many instances we were looking at
8 records that went back to, in some of the districts,
9 some of the earlier attempts at regeneration.

10 So the first thing was then to go to each
11 district and the staff members were undertaking their
12 survey, through all the records, and then put them into
13 a computerized form catalogue. One of the purposes of
14 this was to leave with each of the districts a
15 consistent format for the documentation, particularly
16 of these old records, but which could be the newer
17 treatments, more recent ones, could be fitted in.

18 I mentioned that we started in 1984 with
19 the three regions in the north, north western, north
20 central and northern and the information which has been
21 summarized in Document 27 is for those three regions.

22 Following the review of the Baskerville
23 Audit Report, one of the actions, if you will, was to
24 extend this survey to two other regions and it just now
25 happens then that with the survey, when totally

1 complete, will have covered essentially the area of the
2 undertaking, the three northern regions, northeastern
3 and Algonquin.

4 And I may inform the Board that the data,
5 the base data for those two regions, northeastern and
6 Algonquin, have now been completed, it says the data is
7 to be complete by the first of '89 but the field data
8 has all now been brought together. We don't have it in
9 report form and that has to be undertaken.

10 As I mentioned, the areas that were dealt
11 with were the artificially regenerated ones. We used
12 the entirety of records that were available at the
13 field level, I think this is important. And,
14 secondly -- or thirdly, we said that the sampling must
15 have a statistical basis such that it is, in fact can
16 be justified without, in other words, bias does not
17 enter into it.

18 We then said for these three regions that
19 the three species we were concerned with were white
20 spruce, black spruce and jack pine. There have been
21 small areas of small amounts of red pine and, indeed, a
22 little bit of white pine planted in these three regions
23 but, for the most part, that occurred very early on in
24 the early late 1950s and early 1960s and it is so
25 minimal as to be not -- really not justify as a

1 sampling.

2 However, for the northeastern region and
3 the Algonquin region we have included red pine because
4 it has been the major species planted.

5 In order to give the Board a perspective
6 on what area was being sampled, in Document 27 there is
7 a chart on page --

8 MR. FREIDIN: Q. 227, the one that you
9 have up there.

10 MR. ARMSON: A. Yes. It is the one that
11 is in the handout, 227.

12 Q. Yes, page 227.

13 A. Page 227 which shows in a form of
14 histogram the areas that have been planted and seeded
15 according to provincial records from the period of 1961
16 on.

17 The period for which we have ceased or at
18 least that we did not measure -- after which we did not
19 measure planting was, as I said, 1974 and five years
20 prior to that for seeding.

21 This means that if you look at the
22 histogram, the areas that we were sampling comprised,
23 if we take the total up to 1983 - and I will indicate
24 that just happened to be a convenient spot - 42 per
25 cent of the area planted, but only 5 per cent of the

1 total area that has been seeded in that period up to
2 1983.

3 So we are giving you some sense that in
4 terms of seeding we were only sampling a very small
5 proportion of the total area that has actually been
6 seeded up to that time and certainly since that time,
7 whereas with planting, we were sampling a very
8 significant part of the area, of the total planting up
9 to '83.

10 MR. MARTEL: Was that because the seeds
11 weren't available really until -- outside of natural?

12 MR. ARMSON: Seeding -- some of the
13 earliest seeding on any reasonable - I was going to say
14 operational scale - did not really take place until
15 the -- well into the early 60s.

16 If you look at the graph here, you will
17 see there was none in '61, '63 a little bit, '64, 5, 6,
18 some small amounts. The problem was the technology
19 and seed availability. In order to seed rather than
20 plant, you need very large quantities of seed.
21 Secondly, you have to have a means of distributing the
22 seed in some reasonably uniform manner and originally
23 that was done from the ground and there were any number
24 of problems with that.

25 And in the division of -- what was then

1 the Division of Research of the then Department of
2 Lands and Forests being some of the mechanical research
3 people devised essentially a relatively -- well a very
4 effective piece of machinery called a Brone seeder. It
5 was named after Mr. Brone who was a mechanical
6 engineer,

7 And that incidentally spurred people to
8 go out and do seeding. Again, an example of a simple
9 mechanical device. That seeder incidentally became
10 the basis for arial seeding right across Canada. It
11 could be mounted either in a fixed-wing aircraft in a
12 helicopter or on the back of sowing machines. A good
13 way of doing it.

14
15 So the period of 60s, this is when
16 seeding, we were really learning how to do it and,
17 secondly, we were also having considerable uncertainty
18 as to what kind of preparation should go into areas to
19 be seeded, also what types of results we could expect
20 from seeding with different amounts of seed.

21 One of some of the earliest seeding in
22 the black spruce trial in the operation over here were
23 relatively large amounts of seed used on the basis, if
24 we use a lot something will likely grow. And, again,
25 this is very much the development stage. Now, of

1 course, we have become much more sophisticated,
2 particularly jack pine and we know that certain number
3 of viable seed with a certain type of site preparation
4 in a certain area will most probably give you an 80 per
5 cent probability of success.

6 See, we are getting into quantifying with
7 some relatively high degree of certainty and, in the
8 60s we were not and, in fact, a lot of it was very hit
9 and miss. Some of the areas that were seeded then
10 didn't even have site preparation.

11 MR. FREIDIN: Q. And one of the things
12 you learned with jack pine, I understand was that some
13 areas you were seeding too much?

14 MR. ARMSON: A. Oh, very much so. And I
15 believe that if you look at areas that have been seeded
16 with jack pine, especially in northwestern Ontario -
17 the Board may or may not have seen this, I don't know,
18 from the air - there are young stands of jack pine
19 where we have had to spend money tending for what we
20 call pre-commercial thinning to, in fact, space it out.

21 The principle of growing carrots is the
22 same thing as growing jack pine. If you see a lot of
23 carrots you will get a lot of little ones, and if you
24 seed them fewer just the right and thin you are going
25 to get the right amount for what you require.

1 If I may, what I would like to do is run
2 through one of the tables showing the results to
3 explain to the Board the results on the one table. It
4 is the Table 3 -- pardon me, I jumped ahead, Table 1.
5 Table 1 shows the actual areas that were sampled, the
6 magnitude of the areas by region.

7 Q. That is found at page 229 of the
8 witness statement.

9 A. So you will see that these were quite
10 significant areas with the exception of the black
11 spruce seeded area and there are only 978 hectares and
12 that was in this region, north central region of that
13 type of treatment.

14 The number of plots -- and these plots
15 were 20 metres by 20 metres, and they were located in a
16 random fashion. It was a way of doing -- a randomizing
17 was used and the number of plots was put in
18 proportional to the area. So that it was randomized
19 but there were more plots put in the larger the area,
20 and the total number of plots is indicated for each
21 treatment on that table.

22 MRS. KOVEN: Excuse me.

23 MR. ARMSON: Yes.

24 MRS. KOVEN: Were you looking for pins
25 beside the artificial regeneration?

1 MR. ARMSON: No, no. This had nothing to
2 do - these locations had absolutely nothing to do with
3 any previous survey or assessment. They were based
4 entirely on the records of the project, the map of
5 where that project was and the location in terms of the
6 geographic location and then there was a random
7 selection of both the areas and then within an area,
8 once the sampling areas were identified, there was a
9 random procedure for identifying.

10 It meant, therefore, that the location
11 often was quite an involved and quite expensive one to
12 get to. What we wanted to do was reduce any
13 possibility of bias creeping in. There is always bias
14 in most sampling if proximity to a road and access and
15 so on becomes part of it.

16 MRS. KOVEN: Well, were larger areas
17 excluded on the basis that they had received a sampling
18 on the survival data or something like that?

19 MR. ARMSON: The key questions were the
20 target species and the delineation, if you like, the
21 segregation into those elements of black spruce or
22 white spruce. One of the, I guess you would say a
23 problem, was that some of the earlier plantings, indeed
24 some of the more recent ones, often had mixes of
25 species and you had to make a decision was it going

1 into the black spruce category or the white spruce
2 category.

3 But those were really the decisions.
4 Areas -- plantations that had been destroyed, where
5 there was a record that there was a destruction in
6 there or a significant part had gone into another use,
7 they were not put in as part of the sample for obvious
8 reasons.

9 MR. FREIDIN: Q. Mr. Armson, you
10 indicated that you went back and looked and pulled
11 together all the records that you could.

12 Did this particular project involve the
13 actual going out into the field, out to the areas which
14 were the subject matter of records, to make
15 observations?

16 MR. ARMSON: A. Yes. The crew went to
17 the districts and to a unit where the unit records were
18 kept and went through all possible sources of records,
19 obviously, with the assistance of the field staff.

20 And I may say that one of the purposes in
21 here was not only to find out, but have information
22 that could then be used at the local level by the unit
23 foresters and others at the local level, and I will be
24 returning to that shortly.

25 Q. So, I know the next document that you

1 you are going to put up is Table No. 1B, you selected
2 Table 1B.

3 A. I think it is 3B, Mr. Freidin.

4 Q. 3B, I am sorry, which is found at
5 page 231.

6 A. The table...

7 Q. Before you explain this table, is the
8 information on that table the result of both the unit
9 records and actual visits to the field or only one of
10 those two?

11 A. No. This table summarizes, for black
12 spruce plantations for the one region, this summarizes
13 data that was obtained by the -- after the -- following
14 the establishment of the sample plot or plots in the
15 areas that had been selected as I have indicated
16 already.

17 So this -- if you like, this is in fact
18 what we were looking for although this is an aggregate
19 table, this is the information that we wanted as a
20 result of undertaking the survey.

21 There are maps associated with these
22 locations and the plots, I may say, were located and
23 the instructions and the way in which they were located
24 were to have them so that we can go back to those
25 plots. They are posted and for a life span of, we

1 anticipate, five to 10 years.

2 Q. So the information here is the result
3 of -- is it the result partly or wholly of actually
4 going out to the areas for which you had identified
5 plots?

6 A. The quantifiable information, the
7 data in the line initially planted, is the data that is
8 derived from the project records at the time the
9 plantation was set in. That is how they arrived at
10 that.

11 The remaining data; that is, from the
12 survey, and in the lower part of the table, was all
13 derived from measurements made in the field in '84, '85
14 and '86.

15 MRS. KOVEN: Explain again why we are
16 looking at age-classes older than 120 years if we are
17 not looking at anything more than a 1974 plantation?

18 MR. ARMSON: Oh, because...

19 MRS. KOVEN: We are starting midstream
20 with '74.

21 MR. ARMSON: Yes. We said if normally 10
22 years is when you would look at a plantation for free
23 to grow, then we won't look at anything that has been
24 established within the past 10 years, only those that
25 are 10 years or older.

1 MR. FREIDIN: Q. And for seeding, the
2 cut-off date was 1969?

3 MR. ARMSON: A. The cut-off date for
4 seeding was 1969.

5 Q. So if you are looking at seeded
6 areas, you would be looking at areas that were seeded
7 prior to 1969?

8 A. That's right. So we are very much
9 looking at areas that were artificially regenerated,
10 essentially pre the Forest Production Policy
11 implementation and going back, as you will see, we have
12 a 30-34 year age-class, so we are looking at some very
13 old plantations.

14 Q. Mr. Armson, at the top of the page,
15 top of the graph it has got project age-class years.

16 A. Yes.

17 Q. The first is 10-14. What does the
18 10-14 represent?

19 A. That is the -- for example, we said
20 we would not look at any plantation younger than 10
21 years. So it was split into five-year intervals. The
22 10-14 would be plantations that would be 10-14 years
23 of age, the 15-19, 20-24 and the oldest would be
24 ranking of plantations that were 30-34 years of age.

25 And the areas sampled, in which the

1 sample plots occurred are indicated in the next line
2 and you can see obviously there some -- there is quite
3 a difference in magnitude from the oldest to the most
4 recent, from almost 1,500 hectares in the case of the
5 30-34 year old and something of the order of 12,000.

6 Again that merely reflects the increase
7 in areas treated over the time and that which has
8 continued since.

9 The number of plots is in the second line
10 and gives you some idea of the magnitude of sampling
11 and I remind you, these were large plots, 20 metres by
12 20 metres.

13 Q. And this particular document is --
14 given at the top of this document, this is for black
15 spruce plantations only, just plantations?

16 A. This is for black spruce plantations
17 in the north central region only. There are a series
18 of tables in Document 27 that cover off white spruce
19 plantations, black spruce plantations, jack pine
20 plantations, jack pine seeding in all three of the
21 regions and a summary table identical to this and then
22 for the black spruce seeding there is a seeding for the
23 north central region only.

24 Q. And we are going through this one now
25 just so you can advise how to read this table and the

1 other ones you referred to; is that correct?

2 A. Yes. The first question arose: If a
3 certain number of trees were initially planted, how
4 many could be identified at the time of the survey.

5 So from the survey the first category, if
6 you will, was to identify the planted species and the
7 number of planted trees. Now, this is relatively easy
8 in youngest plantation because normally if there has
9 been site preparation, up keep in mind in many cases
10 there was relatively little site preparation, it is
11 relatively easy, however, because you can follow where
12 the plan arrives you may have kept off a line, but when
13 you get into older stands it becomes often exceedingly
14 difficult especially when there is other growth of
15 other species and when there are natural seedlings of
16 the same species that may happen to grow up in the
17 planted tree.

18 So the numbers of planted trees of the
19 target species, in this case this would be essentially
20 black spruce, are those represented by the numbers in
21 that line, top line of the section from the survey.
22 And you will notice that in terms of the number of
23 trees they are somewhat variable as might be expected,
24 but in some cases one could work out percentages, but
25 this was significant, but you will see there is perhaps

1 in the oldest plantation it would look as if something
2 in the order of 80 per cent of the trees that were
3 planted were found 30 years later, 30 to 34 years
4 later. On the other hand, if you look at the 20-29
5 year age-class there was much less.

6 Q. Which line are we looking at now?

7 A. We are looking now at the line of
8 planted trees that were found in the survey or
9 identified as related to the initially planted ones.
10 Again I would emphasize that the crew had to try and
11 determine which was the planted tree and which wasn't
12 and this is not always difficult. So those are the
13 best estimates that we made.

14 Q. You mean it is not always easy. You
15 said it wasn't always difficult?

16 A. No, not always easy, sorry. In
17 looking at the plots, as I said, we put emphasis on the
18 three species called the target species: White spruce,
19 black spruce, jack pine. We recognize that as an
20 arbitrary category we said that if we have an area that
21 was planted with black spruce and we found white spruce
22 or jack pine there, then we would label those
23 desirable, they weren't the ones that we planted but
24 they were one or both of the other two. So the other
25 desirable means in this case that they were black

1 spruce -- pardon me, white spruce or jack pine.

2 The non-desirable were other commercial
3 species, poplar, white birch, balsam fir, another
4 commercial tree species. So we had, in fact, for each
5 of these sets of treatments a quantification, what was
6 put in there first in terms of planting; what to the
7 best of our ability we could estimate were the residual
8 planted trees what were the desirable trees and what
9 were the non-desirable not in terms of not being
10 commercial, but they were other than the three species.

11 Q. So in relation to that latter
12 category, the non-desirable, they were commercial tree
13 species. Was there any need for those trees to be
14 either conifer, softwoods or hardwoods.

15 A. They could be either. They could be
16 either.

17 MRS. KOVEN: Have a lot of those been
18 removed through treatment?

19 MR. ARMSON: There may have been
20 treatments or not, I would --

21 MRS. KOVEN: Not in the older
22 plantations.

23 MR. ARMSON: Some of these areas might
24 have received a tending treatment. Some of them may
25 have. The likelihood, and I can't tell you whether

1 from -- if we went back to the individual records we
2 could find out, but I don't think that was really a
3 factor of any major import.

4 MR. FREIDIN: Q. So, Mr. Armson, if the
5 Board then or somebody went to look at another table
6 and they happened to be from jack pine plantations,
7 then if you go to the area where you have from survey,
8 initially planted would be the number of jack pine
9 initially planted?

10 A. That's correct.

11 Q. Planted trees under the heading from
12 survey would be number of jack pine?

13 A. That's correct.

14 Q. And the other desirable would then be
15 black spruce or white spruce?

16 A. That's correct.

17 Q. The three species you indicated, the
18 two of the three species you indicated you were
19 interested in the three being black spruce, white
20 spruce and jack pine?

21 A. That's correct. The nine tables for
22 planting are identical in form and they only vary in
23 terms of whether they are black spruce, white spruce or
24 jack pine.

25 MR. MARTEL: Is the Ministry making an

1 effort to reduce the number of non-desirables through
2 treatment? Very frequently - I know that they do some
3 of it, but in other words spraying or that to get rid
4 of an undesirable...

5 MR. ARMSON: There is tending and this is
6 the treatment that was referred to by Mr. Cary when he
7 was discussing the Forest Production Policy. Primarily
8 that tending, though not exclusively, that would be
9 some of form of treatment either using a herbicide or
10 manually to reduce competition or it may be the
11 pre-commercial thinning, spacing out of dense
12 plantation such as you may have particularly for jack
13 pine in seeded areas. So those would be the general...

14 In this table and in each of the other
15 tables the plot data has been aggregated but only for
16 the planted black spruce. This does not mean to say
17 there are other data there, but this was to give you --
18 we are focusing in this report on what happened to the
19 trees that we paid to grow in the nursery, paid to
20 transport, paid to plant and so on. That was the
21 focus.

22 The plot was measured in such a way that
23 we have all kinds of other data relating to other
24 species and soils and so on, but this was the focus of
25 our concern in the summary report.

1 The age, I think that is self evident, I
2 think if you have a plantation that was established in
3 terms of somewhere in the area of 10-14 years you
4 wouldn't expect the average age to lie without that, it
5 should lie within. So 12 years seems to give us some
6 sense of confidence of the trees that we are measuring
7 were planted. And that is the first line there and it
8 merely confirms that the trees they measured, as
9 planted trees had ages within that stand.

10 The average height in metres - and you
11 will notice that there is a general trend in the
12 shorter being in the youngest and tallest and --
13 average diameters. Densities of the planted trees.

14 In some instances these were different
15 from the total planted trees and I will explain this
16 anomaly. You will see if you go back to the column, or
17 the area under the survey, 1,240 planted trees, then
18 when you look down here in the bottom section for the
19 density of trees per hectare for planted black spruce
20 only you will see 856. What happened to the other,
21 what was it, almost 400. You will see a footnote
22 there, the trees they measured were the planted black
23 spruce.

24 In terms of the planted trees they were
25 primarily black spruce. It means in many of these

1 plots they had mixed in, in most instances, white
2 spruce with the black spruce. So there were in fact
3 the 1,240 planted trees but of those 840 -- or 856,
4 sorry, were actually the planted black spruce they
5 measured. So that would indicate there was some mix of
6 species in those plantations.

7 The basal area, it was mentioned by Mr.
8 Gordon and earlier by Dr. Osborn in Panel 3, that there
9 are various ways of measuring the degree to which trees
10 occupy an area. When they are small you can count them
11 on a quadrature basis and say there is one here and one
12 there, two or three or whatever. Density is the
13 absolute number per unit area.

14 But once they reach a certain size they
15 grow up and achieve a diameter, the stem becomes
16 measurable in diameter, they often use the measure of
17 accumulating the surface area of the bowls of the trees
18 and putting that in relation to the total land surface
19 area, in other words, what is the number of square
20 metres occupied by the trees we are interested in per
21 total area per hectare.

22 So what you see here, the number of
23 square metres we call the basal area and that's fairly
24 obvious, Mr. Martel.

25 MR. MARTEL: Yes.

1 MR. ARMSON: Even if it is a technical
2 term and you will see there is a progression from the
3 smaller basal area to the larger, which is what you
4 would expect.

5 MR. FREIDIN: Q. I was going to ask a
6 few questions on that. You can leave it up there, Mr.
7 Armson?

8 MR. ARMSON: A. Yes.

9 Q. You indicated that measurements here
10 were made of the planted black spruce only and in
11 paragraph 50 of the witness statement, page 34, you say
12 the basic data for each sample consisted of tree
13 measurements of density, numbers per hectare, height,
14 diameter and basal area, together with other
15 information such as stocking and soil descriptions.

16 Did you -- for what species did you make
17 all of those measurements and I mean the density, the
18 height, the diameter and the basal area?

19 A. The target and desirable species in,
20 other words white spruce, black spruce and jack pine
21 were the ones for which the detailed measurements were
22 made.

23 As I said, the data in these tables is
24 only that for the planted species or seeded species as
25 the case may be. The measurements for the other

1 species, whether they be the other target species or
2 the other commercial species, because there were height
3 measurements, for example, made of the other commercial
4 species, there were measures of their density as
5 indicated here. These data plus detailed soils data
6 were all also obtained in the plot -- in the records.

7 Q. So if you went into a black spruce
8 plantation and you found the other desirable species
9 jack pine and white spruce, would there be a
10 measurement of these trees in that particular stand?

11 A. Yes.

12 Q. If there was a commercial tree
13 species in that area, poplar for instance, there would
14 be some measurements made, but not all four
15 measurements?

16 A. There were various methodologies used
17 on each plot and without going -- the report doesn't go
18 into the methodologies. One of the methodologies was
19 to use a series of two metre by two metre stocking
20 plots within the 20 metre by 20 metre plot.

21 There were two metre by five metre plots
22 and there was a methodology which we call a vertical
23 transect method. Those techniques were all used to get
24 a good deal of information. The purpose, as I say, was
25 to get a detailed quantifiable picture of these stands

1 for use (a) at the local level particularly and then
2 which might be used subsequently for other purposes
3 which I will go into shortly.

4 Q. Continue.

5 MRS. KOVEN: I have just one comment
6 about this chart. In the third box, the results from
7 the survey.

8 MR. ARMSON: Yes.

9 MRS. KOVEN: The trees were categorized
10 as other non-desirable, other desirable and
11 non-desirable are trees that have grown naturally.

12 MR. ARMSON: That's correct.

13 MRS. KOVEN: It is sort of a simplistic
14 interpretation of this section is that nature does a
15 much better job than we do and if we weren't concerned
16 about the species we plant, we would...

17 MR. ARMSON: That is correct, Miss Koven.
18 In fact, if you burn an area, cut an area in this part
19 of the world woody vegetation will come back and, for
20 the most part, it will be tree species sooner or later.

21 There are a number of features that -- I
22 might just point out, using this particular table as an
23 example, you will notice that there is, in terms of the
24 planted trees, there is a system variation but there
25 is - and this shows up in the other tables perhaps to

1 even a greater degree - but there is a tendency for the
2 initial number of trees planted to generally increase
3 somewhat. It is much more marked in some of the other
4 tables than in the black spruce.

5 The best reason that I could probably
6 offer for that is that site preparation has improved
7 over this period of time and it, in fact - and again
8 Mr. Gordon mentioned this - as you improve the site
9 preparation you are able to put more trees per unit
10 area around. It certainly shows up in some of the
11 other tables.

12 You will also notice that if you take
13 either the individual numbers for planted trees, for
14 other desirable or non-desirable and, therefore, if you
15 take the total, there is a general trend for a
16 reduction of density downwards from the youngest to the
17 oldest, not particularly striking here perhaps and
18 somewhat variable.

19 But this is not unexpected and, again, I
20 believe that in Panel 3 I believe Dr. Osborn was
21 showing a graph at one stage of the numbers of stems of
22 stems over time depends to come down sort of a life
23 table, if you will. That shows up in this data.

24 MR. FREIDIN: Q. That's fine. I have no
25 questions, not now.

1 MR. ARMSON: A. Okay.

2 Q. Now, Mr. Armson, you indicated that
3 some of this information would be useful, the type of
4 information which is reported on documents such as the
5 black spruce plantation document that we went through.

6 Can you indicate how it could be useful?
7 Could you indicate how it would be useful?

8 A. Well, these data, if we go to the
9 regions of the local level, these data represent
10 probably the most detailed information concerning these
11 older artificially regenerated areas and when they
12 are -- the data at the field level are separated out
13 into, for example, areas in which you have the target
14 species the planted black spruce, white spruce, or jack
15 pine or the seeded species, where they obviously from
16 the plot data indicate that they are dominant, so that
17 is the stand that is being produced, then you could
18 well look at them and if they not been visited in terms
19 of a free to grow assessment, one could go to them.

20 Secondly, where they would indicate that
21 there is a number of the target species or desirable
22 species present, but there is a large number of
23 competing commercial species, and from the description
24 not only of the stand but of the soil, conditions that
25 are present, and that is in the record, the forester

1 might well look at those and say: Here is an area that
2 we have not treated to remove -- to reduce the
3 competing vegetation, but it is a highly productive
4 area for whatever species the target species, white
5 spruce black spruce and perhaps we should consider
6 tending that to improve it.

7 Related to that there may be a very high
8 density of the jack pine or black spruce there and the
9 data would then suggest that that be inspected with the
10 possibility of applying a pre-commercial thinning if --
11 again, if the soil conditions -- and this was one of
12 the points that we felt through here to aid management
13 decisions as to what might be done in terms of
14 subsequent treatment or no treatment.

15 At another level, either regional or even
16 at provincial we have data where if we were to consider
17 an experimental or operational trial and we wished to
18 conduct these trials for whatever purpose in a certain
19 type of stand that had been artificially regenerated,
20 we would in effect have, from the catalogues that have
21 been developed, an array of those kinds of stands and
22 their location that we could go to.

23 One of the most perhaps frustrating
24 things when you wish to undertake operational trials or
25 experimental work is to find the appropriate areas and

1 stand conditions in which you can carry out those
2 trials. And I can assure you it is not always easy and
3 this was one of the purposes to which this might be put
4 at other than the immediate local level.

5 Q. Looking at that black spruce table
6 that we had up on the screen in the second box it
7 indicates that density was recorded. Can you advise
8 whether density, as referred to there, was different in
9 any way from stocking described by Mr. Gordon?

10 A. No, this was density as described by
11 and defined as density by Mr. Gordon, not stocking.

12 Q. Can you just define then density?

13 A. Density was the number of individuals
14 per unit area, in this case trees per hectare.

15 Q. If I might just go back for a moment
16 to the Table No. 1 where it indicated a number of plots
17 which had been identified for each of the three species
18 of interest.

19 Dr. Osborn indicated in his evidence in
20 Panel No. 3 when he referred to the possibility of
21 these particular sites, the SOARS sites as possibly
22 being areas where permanent sample plots would be
23 established.

24 I am just wondering if you could comment
25 on whether it would be reasonable at this particular

1 time for these particular plots to be used as the basis
2 of permanent sample plots?

3 A. It is possible that some of those
4 plots would be considered as candidate permanent sample
5 plots. I say that with -- for this reason -- these two
6 reasons:

7 I have indicated the purposes of the
8 survey and why we wanted and had the plots located in a
9 semi-permanent fashion. It is quite conceivable that
10 some of them, in fact, could become part of an array of
11 permanent sample plots, but there are two qualifiers
12 with regard to these plots that probably would minimize
13 that.

14 First of all, the conditions under which
15 this regeneration took place was prior to 1974 and in
16 many of the instances, though not all, were conditions
17 and types of treatment that are not similar to those
18 which are generally conducted today. And if we were to
19 look at these plots for examples, if you will, in terms
20 of a long-term permanent sample plot array, we would
21 have to recognize that the conditions of establishment
22 and the nature of the conditions there as a result are
23 probably dissimilar from what further series in a time
24 series might include. That is one reason.

25 A second reason is that increasingly and

1 this was brought out by Dr. Osborn using the example of
2 the managed red pine yield tables, that in the new
3 forest, when we are looking to establishing permanent
4 sample plots to obtain quantification of growth and
5 yield, it will be most useful when it is related to
6 management objectives or certain broad kinds of
7 management treatments.

8 And in the red pine tables there was an
9 inclusion in those tables for the amount of wood could
10 be extracted in thinning. These stands that were
11 sampled in this first survey, we don't know - and the
12 records are not clear in fact in many instances, as to
13 what the purpose or management objectives when the
14 project was established was for that area.

15 I think in some of the earlier areas it
16 was a question of project to plant areas, it was mainly
17 to get trees on the ground. And so a second element
18 that, if we were establishing permanent sample plots
19 would be to take into account some clear management
20 objectives or broad treatments that could be used as a
21 category.

22 Yes, Mr. Martel?

23 MR. MARTEL: If you were to establish
24 permanent plots and after the first 10, or 12 or 15
25 years you look after them carefully, went back, would

1 that reflect - if that period extended - would that
2 reflect what was going on in the rest of the forest as
3 opposed to going out and picking plots as to what was
4 going on?

5 And I am not sure if I am explaining
6 myself properly, but I worry -- I don't know, I simply
7 don't know. If you have gone 20 years and looked after
8 it adequately, one would anticipate that the next 40 or
9 50 years to rotation would be fairly consistent, if I
10 can use that term. But what is going on in the rest of
11 the forest, would that be reflected in terms of growth
12 and so on if you were just dealing with permanent
13 plots.

14 Could you make a comparison?

15 MR. ARMSON: Now, I am not a
16 statistician, but one thing you can be sure with
17 permanent sample plots is that the only data that is
18 absolute is the data that is obtained from the plot and
19 that anything else is a matter of extrapolation or
20 dealing in some kind of a probability.

21 One of the reasons for establishing these
22 plots in this particular instance on a statistically
23 sound sampling basis was that it had some element of,
24 if you like, ability to say it is a sampling of a
25 certain defined population.

1 But certainly, any of the data that you
2 obtain in actual fact you could only say a hundred per
3 cent apply to that, but we believe - and I think from
4 the whole point of sampling is to obtain estimates that
5 have some degree of probability of accuracy.

6 MR. FREIDIN: Q. I think, Mr. Armson,
7 just one question following along from Mr. Martel's
8 question, when he asked you the question you
9 indicated -- you said: If you look after a particular
10 stand for 20 years that he would expect it would do
11 okay from there to rotation and that would be an
12 indication of how the other parts of the forest were
13 coming along.

14 I am just wondering if you establish
15 permanent sample plots, you indicated that a purpose
16 would be to obtain information about growth and yield.

17 MR. ARMSON: A. That would be one of the
18 major purposes.

19 Q. And if you were establishing
20 permanent sample plots for that purpose, would there be
21 areas where in fact or locations where you would have
22 plots where you would do nothing in the stand as
23 opposed to, as I think Mr. Martel is suggesting,
24 looking after it closely for 20 years?

25 A. Yes, one -- in fact, one of the

1 ways -- the only way you can really ultimately justify
2 a treatment or investment is to see how that achieves
3 whatever measure it may be, whether it be increased
4 growth in comparison to the area where you do not
5 treat.

6 I think Ms. Koven mentioned one of the
7 items here, if you look at one of the tables, the black
8 spruce table, Table 3B it would appear that nature
9 revegetates the area with a commercial species at least
10 if not the conifer species to a very high degree.

11 So I think there has to be a benchmark if
12 you are measuring the effects of some form of treatment
13 or investment, but over and above that, if I may
14 continue, there is also a concern with measuring what
15 are the changes in those "untreated areas" to, in fact,
16 find out what does happen to those areas.

17 So we are not talking always about plots
18 which you treat, we are talking, yes, very much also
19 about what we call controlled areas or areas which are
20 untreated although they may have been established by
21 artificial regeneration to start with.

22 MR. FREIDIN: Mr. Chairman, are you
23 planning on...

24 THE CHAIRMAN: Mr. Freidin, I think we
25 will take a break at this point for 20 minutes and then

1 when we come back we will go no later than a quarter to
2 four.

3 Thank you.

4 ---Recess at 2:35 p.m.

5 -- -Upon resuming at 3:00 p.m.

6 THE CHAIRMAN: Thank you, be seated.

7 MR. FREIDIN: Q. Mr. Armson, as a result
8 of the information which was contained on the table in
9 relation to black spruce plantations and all of the
10 other similar tables for the three northern regions -
11 those tables appearing on pages 230, 231, 232 - those
12 deal with plantations of black spruce, white spruce and
13 jack pine respectively, and the tables on page 233
14 dealing with seeding of jack pine in the three northern
15 regions and the table on page 234 which deals with the
16 seeding of black spruce in the north central region,
17 are you able to come to sort of general conclusions or
18 identify any trends which arise as a result of a review
19 of those results?

20 MR. ARMSON: A. Yes, I can. First of
21 all I would direct the Board's attention to the tables
22 of planted whited spruce, black spruce and jack pine
23 and those are on pages 230, 231 and 232.

24 And if you scan, as we have already
25 looked at the -- on the overhead, the table for black

1 spruce, but if you were to look on page 230 for white
2 spruce and look at the numbers of trees initially
3 planted, which is the top line in each of the three
4 tables on that page, I think you will see there and on
5 the subsequent pages for planted black spruce and jack
6 pine that there is a consistent trend of larger
7 numbers, higher density of planted trees; that is,
8 initially planted, the younger the plantation.

9 So, as in the witness statement it says:

10 "The density of trees planted generally
11 increases from the oldest to the youngest
12 age-class."

13 Q. And you are referring to page 235
14 where these trends are actually discussed.

15 A. That is correct. And as I indicated
16 earlier, the most likely reason is the general
17 improvement in site preparation and, therefore, the
18 provision of more planting spots.

19 The second trend that is quite clear is
20 that for each of these three types of plantations there
21 are a large number of desirable; that is, if it was
22 white spruce, one or both of the other two species, and
23 non-desirable, that is the commercial other species
24 contributing, and if in looking through these tables
25 you will see that they generally contribute more than

1 half of the total stem numbers on the plot.

2 One of the, I guess the simplest ways of
3 describing it is that there is an exceedingly great
4 diversity in terms of other species coming in there and
5 as Ms. Koven pointed out there is a large amount of
6 tree growth there that is other than that which was
7 actually planted.

8 The third trend that is there in general
9 is the reduction and, again, I had mentioned this
10 briefly earlier, that as we would expect the number of
11 individuals, the density, reduces as the stand ages and
12 that so-called life curve reduction is pretty well a
13 fundamental one in all forest stands, certainly in this
14 province.

15 In addition to those general trends which
16 apply for all of them, there are some differences
17 related to species.

18 Q. When you say with those comments, you
19 refer to all of them.

20 A. Of the planted three species, white
21 spruce, black spruce and jack pine.

22 Q. Thank you.

23 A. In the black spruce, and this showed
24 up in the Table 3B that I had on the overhead, the
25 density of the black spruce or the black spruce and the

1 desirable -- in other words, if you lumped those two
2 categories together and if you look on page 231 this
3 would be the summation of the planted trees and other
4 desirable, but generally speaking, as compared,
5 particularly with white spruce -- in the black spruce
6 there is a greater density for those two categories put
7 together than there would be in the white spruce, and
8 they remain larger numbers into the older age classes.

9 The document doesn't suggest why, it
10 could be a number of reasons. I don't know whether the
11 Board would be -- I suspect this is related to the
12 nature of the site conditions under which the black
13 spruce was planted rather than as a major factor
14 because normally they would have been planted on some
15 of the wetter areas where other poplar and white birch
16 would not be contributing to the same degree.

17 I think that is the most likely reason.

18 THE CHAIRMAN: I think if I recall from
19 the other tables from the survival testing or the
20 survival assessment things that white spruce was at the
21 really low end, it didn't seem to survive as well as
22 any of the other species anyways.

23 MR. ARMSON: That is correct. Many of
24 the early attempts at plantation and indeed some now
25 have been made to establish white spruce stands. White

1 spruce stands are an unusual type of forest condition
2 in northern Ontario, very unusual. Normally white
3 spruce is found in a mixture of other species.

4 Earlier today I was referring to the
5 upland mixed wood and that is normally where the white
6 spruce is found, perhaps a hundred or so per hectare or
7 something of that order and that in the earlier
8 establishment other species came in and basically took
9 over from much of the white Spruce unless there had
10 been very major attempts at controlling the other
11 vegetation.

12 And we do have white spruce plantations
13 that are in fact white spruce stands and in -- not
14 totally pure, but very close to that.

15 MRS. KOVEN: Do we know if there are any
16 differences between planted -- the planted species and
17 those growing naturally by the characteristics of
18 height, diameter and basal area?

19 MR. ARMSON: The normal forest, if we
20 take jack pine or black spruce and this will show up in
21 the seeding now, but if we compare the diameter growth
22 of the planted jack pine or planted black spruce
23 particularly, or even white spruce compared to natural,
24 again the jack pine and black spruce particularly after
25 fire, the normal major difference is in the density.

1 The densities are much lower in the
2 stands that we establish. They are obviously lower
3 because of the number of trees we have planted, but
4 even given that, they are generally lower and,
5 therefore, the diameters tend to be greater for a given
6 age or height.

7 That is probably the single difference --
8 major difference in terms of the individual tree
9 measurements. It shows up -- perhaps I might -- it
10 shows very clearly, if you compare the diameters of the
11 seeded jack pine on page 233 -- if you look at the
12 diameters of seeded jack pine or the density compared
13 to planted jack pine on page 232, for example, if you
14 start with the northern region, the density of trees,
15 jack pine seeding, are respectively are for the
16 youngest 2,478 and the other one 2,820.

17 In terms of initially planted, you are
18 looking at something, for the most part, less than that
19 in the jack pine plantations, 60 and 61 and 1,740,
20 there is one there that is just over 2,000 and then
21 1,891 for the initially planted.

22 But then if you look down at the
23 diameters there is an N/A in there and I can't explain
24 that one for the Board, so if we might drop to the
25 north central region it is the same thing if we look at

1 the densities. For seeding considerably greater than
2 for planting and if you look at the diameters you will
3 notice that the associated diameters are lower for the
4 seeded jack pine of the same age-class than for the
5 planted jack pine.

6 For example, if you take the 20-24 year
7 age-class in the seeded jack pine, the average diameter
8 is 9.2 metres, and if you take that same age-class in
9 the planted, it is 10.3 and this is a reflection of
10 density.

11 And coming back to your point, the
12 natural stands after fire would be even far denser than
13 those which are seeded here.

14 Interestingly enough the black spruce
15 seeding, although it is a small sample, doesn't show
16 that same difference or certainly not to the same
17 degree. Most likely it's a small sample so I wouldn't
18 want to draw any firm conclusion, but the crown form in
19 the way in which jack pine grows compared to black
20 spruce could be a reason for it, but I think the sample
21 is too small to draw any firm conclusion.

22 Generally speaking, the higher the
23 density the smaller the diameter for a species in a
24 given age-class.

25 MR. FREIDIN: Q. Can you continue, Mr.

1 Armson. I think you were on page -- dealing with the
2 trends identified on page 235.

3 MR. ARMSON: A. Yes.

4 Q. Maybe if you have covered most of
5 it...

6 A. I think I have covered most of it.
7 The differences in the proportions of desirable species
8 was a point that was noted here, that in the northern
9 and northwestern regions the density of the jack pine
10 plus the other desirables were large. I think I may
11 have alluded to that earlier, but this was...

12 We come back to a point that Mr. Gordon
13 made earlier and this was when he was discussing the
14 free to grow tables and you may recall there was a
15 section in there dealing for the various regions, but
16 particularly the northwestern and northern region of
17 mixed conifers, in many of the areas that are treated
18 perhaps to planting or seeding to either jack pine or
19 black spruce in particular, often the species that was
20 there and was harvested was a mix of those species.

21 What may come back is a mix that may
22 depend on (a) what was done in terms of the treatment,
23 but also we usually find, as was indicated, that the
24 site preparation itself with the residual cones will
25 result in many jack pine or black spruce coming from

1 the cones and seed from the original harvested stand.

2 And when this occurs you can often have
3 mixed stands and it is really six of one and half a
4 dozen of the other whether they would move to a black
5 spruce, a spruce working group, if you will, or a jack
6 pine working group and, in many instances commercially,
7 certainly in terms of many of the industries, either
8 one is totally acceptable.

9 So that mixed conifer - and really here I
10 guess I am coming back to a point about whether it has
11 been silviculturally effective or regeneration
12 effective. Sometimes those two can merge, if you will,
13 you didn't get maybe the black spruce stand it came out
14 as a jack pine with a major amount of black spruce and
15 one might consider that silviculturally successful
16 also, but it isn't exactly a nice neat sharp line
17 between silvicultural effectiveness and regeneration
18 effectiveness.

19 Q. Does that complete the comments that
20 you would like to make in relation to those tables that
21 I referred to?

22 A. Yes.

23 Q. Now, at the bottom of page 235 there
24 is a heading. It says:

25 "What do the results mean?"

1 Can you advise me whether the results
2 referred to or deal with the tables that you have
3 already referred to?

4 A. The results that I have described
5 were related to the purposes for which the survey was
6 undertaken. I was asked to present to senior
7 management of the Ministry - this would be more than
8 six months ago - a summary of the results of this
9 survey as it related to the Baskerville Audit and the
10 subsequent surveys.

11 When I did that I was asked a question,
12 having gone through the summaries that I have given the
13 Board, well, that is very fine, and those are all
14 interesting data and you are no doubt going to be of
15 interest at the local level, regional level, and to
16 forest staff at the provincial level, but what does it
17 mean in terms of whether these areas are back into the
18 inventory.

19 And I would point out that that was not
20 the purpose for which the survey was undertaken. Well,
21 what I did was I asked the staff who had been involved
22 in compiling these data, in fact doing the field work
23 and compilations if they could take the plot data and,
24 if they could, from the data, segregate it as best they
25 could according to species and development, growth,

1 density, so that the senior management might get some
2 idea of how successful these areas were planted or
3 seeded in the early years in relation to coming back
4 into "the inventory" as part of the maximum allowable
5 depletion, because obviously that was really why money
6 was invested in planting and seeding.

7 So they did that and they had to make
8 some judgments because the data were not put on the
9 basis of the free to grow survey as indicated by Mr.
10 Gordon. What we have then is a series of tables and
11 the first question that I asked him was to segregate
12 the plots, as again, as best they could as to whether
13 the areas represented by the plots would in fact be in
14 the inventory as part of the production forest. That
15 was point No. 1.

16 Secondly, I said within that, within that
17 category separate it out as to whether the target
18 species and individually; that is, if it were white
19 spruce, or collectively, met free to grow standards in
20 terms of height and the numbers, in this case the
21 density rather than the stocking, or whether they were
22 there in suitable numbers but the target species, the
23 three species, the desirable were there but they
24 weren't of the order of growth or height to meet that
25 standard. And height was one of the attributes that was

1 measured in the plot.

2 So they segregated those out and those
3 tables are on pages 238 and there are associated
4 histograms with those tables and, if I might, I have
5 taken out of the document and put on an overhead the
6 tables for white spruce -- planted; that is, and
7 planted jack pine and I would like to go through those
8 tables -- the tables and the histograms to explain to
9 the Board what that interpretation resulted in.

10 Q. That document that is on the screen
11 is found on page 238.

12 A. Essentially there are, therefore,
13 three categories. The first one that I indicated to
14 you was broken down into two. So Category 1. This
15 table then is for planted white spruce and it presents
16 the percentages, the absolute areas, the total areas
17 are indicated in numbers on the histogram. So you can
18 relate the percentages back to absolute areas.

19 There were three categories,
20 sub-categories within each of the first two table
21 formats. The first category said: Is this area that
22 the sample was in, does it come back into the maximum
23 allowable depletion base for the target species. And
24 if the answer was yes, then it was sub-divided into
25 three categories, the spruce working group or forest

1 unit, say here and that means explicitly white spruce
2 only, that does not include black spruce.

3 You may recall we might have had other
4 target but that is the percentage of the area that
5 actually -- and that would be a per cent in this case
6 of 8,826 hectares -- 10 per cent of that went into the
7 spruce working group in the northwestern, 10 per cent
8 in the north central and 12 per cent in the northern.

9 Q. Mr. Armson, you said that this table
10 indicates that the area in which the sample was taken
11 was free to grow in the target species.

12 Now, when you use that term, does that
13 refer to the one which is planted or any one of the
14 three which are desirable; jack pine, white spruce, or
15 black spruce?

16 A. If it were spruce it only refers to
17 white spruce. If it were in the mixed conifer, then it
18 could be jack pine, or black spruce. This was one of
19 the -- in the segregation, this is one of the things,
20 they had to put those two together.

21 But through here, where you see the
22 conifer, whether it be white spruce, mixed conifer,
23 that would be one or both of the other two species,
24 black spruce and jack pine, or here mixed conifer and
25 hardwood, that is a mixture of the conifer target

1 species and the hardwood, then in all those three
2 categories one or more of the target species and, in
3 the first line, that would always be white spruce, are
4 free to grow.

5 Q. So I just wanted to review that,
6 mixed conifer in this particular case would be a stand
7 in which you had at least two of the three desirable
8 species?

9 A. That is correct.

10 Q. It could have others?

11 A. Could have others, but undoubtedly it
12 would have poplar and white birch.

13 Q. But mixed conifer and hardwood, am I
14 correct that you could almost put a comma after mixed
15 and really what you have is a stand in which it is a
16 mix of conifer and hardwood where at least one of the
17 conifer species which is free to grow is one of the
18 three desirable?

19 A. That is correct.

20 Q. And there has to be in that stand at
21 least one hardwood species which is free to grow?

22 A. That is correct.

23 Q. Thank you.

24 MR. MARTEL: Where do the figures come
25 from. You have the 10, the 20, they are percentages of

1 what?

2 MR. ARMSON: They are percentages. I am
3 sorry, Mr. Martel, the actual areas that they represent
4 were on the histogram, they are on the histogram
5 associated with the table.

6 MR. FREIDIN: Page 239 of the document.

7 MR. ARMSON: They should have been on the
8 table rather than the histogram, but they were put on
9 the histogram instead. So what you are looking at in
10 terms of white spruce for the northwestern region is a
11 total of 8,826 hectares.

12 You dig through the piece, you are
13 looking for the actual number, that is where you will
14 find it.

15 The second category then was: Are one or
16 more of the target species; that is, these three again,
17 present in numbers that would meet the criteria for
18 inclusion, but they are not free to grow; in other
19 words, they have not the height nor free of
20 competition. And the second table here then represents
21 the proportion that are in that category, the very
22 small proportion, as you might expect, in terms of
23 white spruce and these are the proportions, percentages
24 for the mixed conifer as, in this case, defined the
25 same way as in Table 1 and the mixed conifer together

1 with the hardwoods as defined in Table 1.

2 And you will notice that the subtotals
3 for the region are put in in both Table 1 and table 2
4 and when you add those up - and this is perhaps where
5 the histogram shows it best - the relative amounts in
6 those three -- the first two categories, if we look at
7 those, are represented by the blue and by the green.

8 So, if you were looking "in the narrow
9 sense" for silvicultural effectiveness, using these
10 data and the plot results which they weren't
11 particularly designed for, this would give you some
12 sense of the relative silvicultural effectiveness,
13 whereas the regeneration effectiveness would be the
14 total of the blue and green.

15 MR. FREIDIN: Q. Sorry.

16 MR. ARMSON: A. Yes?

17 Q. In relation to that particular
18 matter, I am wondering whether you can just go back to
19 the previous drawing -- or the chart in relation to
20 your comment you just made about the blue and green
21 could be the regeneration effectiveness.

22 In the second table, Roman numeral II it
23 says that it meets density standards for inclusion in
24 the inventory but is not free to grow for the target
25 conifer species.

1 The table does not speak to whether or
2 not the areas which are referred to in Table No. 2 are
3 free to grow for some species other than one of the
4 three.

5 Could you advise whether in fact those
6 stands are free to grow in a species other than one of
7 the three target species?

8 A. Yes. If you like, the single
9 important division which related to the first question
10 was: What would be back in the inventory as part of
11 the maximum allowable depletion.

12 So that the stands that are here,
13 although they are not free to grow for the target
14 species, are free to grow for other commercial species
15 poplar, birch or what could be balsam fir and they
16 would come back into the inventory, so they would
17 represent that type of stand.

18 Q. Now, could I just go through that
19 particular table and could you advise me whether I
20 describe the situation correctly.

21 In the second table for spruce, the areas
22 which you have described are free to grow in a species
23 and it has to be a commercial species?

24 A. Yes.

25 Q. Which is not one of the three target

1 species?

2 A. Correct.

3 Q. And in that stand spruce was present
4 and was present in sufficient quantity that it met the
5 density standards that you referred to?

6 A. That's correct.

7 Q. And the second one then would be
8 found -- would be describing the percentage of stands
9 which were free to grow in a commercial tree species
10 other than one of the three target species?

11 A. That is correct.

12 Q. In which they were mixed conifer, at
13 least two of the three conifer species were present,
14 the three -- two of the target conifer species were
15 present and they met -- they were not free to grow but
16 they met the density standards and we just do the same
17 thing for the next one?

18 A. Yes.

19 Q. Thank you.

20 A. The plots which did not meet in terms
21 of either density for the planted or seeded species,
22 the three or free to grow, either collectively, were
23 then the remainder and they are indicated in this third
24 table. These areas may or may not be free to grow in
25 terms of may be a pure poplar stand, or it may not be

1 free to grow at any time.

2 So the three sets of data for the three
3 tables, again coming to the histogram, the yellow then
4 represents essentially that third array of plots or
5 areas in which the target species were not present in
6 either density nor in free to grow stands.

7 Q. Hypothetical, if you had a stand
8 which was a poplar stand and it was free to grow in
9 poplar --

10 A. It would most likely turn up in one
11 of those three categories.

12 Q. It would fall under the 21 per cent
13 northwestern -- 21 per cent of the -- what does the 21
14 per cent of the area refer to?

15 A. That is correct.

16 Q. What does that refer to?

17 A. That refers to the plots representing
18 the area that didn't fall into either the first two
19 categories. I presented that for the white spruce
20 because in terms of looking at the data - and again I
21 point out the plots weren't established for that
22 purpose - that probably represents in terms of white
23 spruce and that was pointed out, where we have been
24 less effective in terms of the silvicultural or the
25 establishment by silvicultural treatments of white

1 spruce.

2 The areas involved in planting jack pine,
3 and these are the tables that are on page...

4 THE CHAIRMAN: 242.

5 MR. ARMSON: 242, they are exactly the
6 same format, the same basis and they give you a set of
7 data and I chose these because, in terms of planting,
8 this has been one of our major species and it gives you
9 again a portrayal which perhaps may be best seen in the
10 histogram, I believe it's Figure 7 in the Document 27.

11 And what it portrays is relatively
12 greater effectiveness silviculturally in establishing
13 jack pine plantation than white spruce. That is in
14 fact a common knowledge of foresters and others in the
15 province generally. Because the areas in which we had
16 jack pine stands were we established them have been
17 areas that have been generally much freer of competing
18 vegetation, of an outwash sand conditions, dryer and so
19 on and, in fact, we have honed our silviculture
20 expertise to a very large degree on this kind of
21 condition in a species which is much more effective.

22 Q. Just looking at that particular
23 overhead, the second category which is coloured green
24 described as meeting the density for inclusion in the
25 inventory, but not free to grow for target and conifer

1 species.

2 Which species -- are you referring to one
3 or are you referring to more than one species when you
4 use the phrase target conifer species in that
5 particular example?

6 A. It is used in relation to being white
7 or black spruce in this case.

8 Q. As a result of those particular
9 tables and information contained therein, Mr. Armson,
10 were you able to come to any conclusions or indicate
11 any trends?

12 A. Yes, I was.

13 Q. And is that particular subject matter
14 dealt with commencing on page 235?

15 A. Yes. On page 235 the summary and
16 observations of the --

17 MR. FREIDIN: Mr. Chairman, I can't
18 recall whether you wanted to leave at 3:30 or 3:45.

19 Mr. Armson I think is going to take more
20 than 15 minutes, I think, to deal with the results or
21 trends arising from the tables we just referred to. It
22 might be better to --

23 THE CHAIRMAN: Well, unfortunately I have
24 to catch a plane so I cannot be any later than 3:45.
25 So if you want to break now --

1 So if you want to break now --

2 MR. FREIDIN: Well, I am just thinking it
3 would be a convenient place to break and we will start
4 off with those results tomorrow.

5 THE CHAIRMAN: Very well. Ladies and
6 gentlemen, we will adjourn now until tomorrow morning.
7 I am proposing that we start at 11:30 a.m., barring the
8 plan arriving on time I should be able to get back here
9 then.

10 If it does not arrive, then you can
11 either wait for me, start without me, take a lunch
12 break, I will be here eventually.

13 MR. FREIDIN: We won't be here at 8:30 to
14 start I can assure you of that.

15 THE CHAIRMAN: Thank you very much.

16 ---Whereupon the hearing adjourned at 3:40 p.m., to
17 reconvene on Wednesday, August 10th, 1988,
commencing at 11:30 a.m.

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